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STATE OF NEW YORK.

ONE HUNDRED AND ELEVENTH SESSION,

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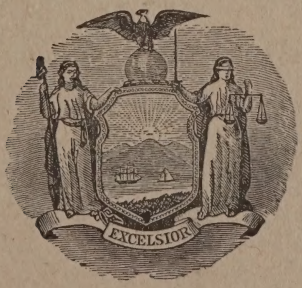
VOLUME V.—NOS. 30 TO 36 INCLUSIVE.



THE TROY PRESS COMPANY, PRINTERS.
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STATE OF NEW YORK.

No. 30.

IN ASSEMBLY,

JANUARY 20, 1888.

COMMUNICATION

FROM THE

GERMAN-AMERICAN BANK CONTAINING A LIST OF BALANCES REMAINING ON HAND, PRIOR TO SEPTEMBER, 1887.

THE GERMAN-AMERICAN BANK,
NEW YORK, *January* 12, 1888.

The Honorable Speaker of the Assembly, Albany:

According to law we send you herewith a list of balances remaining in our bank for two years prior to September, 1887, which was duly published in *Evening Post*, September 30, 1887.

Very respectfully,

J. F. FREDERICHS,
Cashier.

273315

Balances.

Bigelow & Co.	$17 84
Cohn, D. L.	17 58
Hart, Henry	104 04
Jamison, B. A.	10 94
Gottlieb Straus & Co.	8 98
New York Exchange Company	26 00
New York, Boston and Kennebec Ice Company	104 99
New York Underwriters' Agency	304 00
Seabra, Antonio Pebeiro	52 46
Lopez & Co., John.	14 62
Steinle, E.	146 55
Towne, W. H.	54 11
Witt, J. J.	9 25
Zoepfel, E. H.	3 03

SIXTEENTH REPORT

OF THE

Commissioners of Fisheries

OF THE

STATE OF NEW YORK.

TRANSMITTED TO THE LEGISLATURE JANUARY 24, 1888.

THE TROY PRESS COMPANY, PRINTERS.
1888.

STATE OF NEW YORK.

No. 31.

IN ASSEMBLY,

JANUARY 24, 1888.

SIXTEENTH REPORT

OF THE

COMMISSIONERS OF FISHERIES.

BROOKLYN, *January*, 1888.

Hon. FREMONT COLE, *Speaker of the Assembly:*

SIR.—I have the honor to transmit herewith, in compliance with law, the Annual Report of the Commissioners of Fisheries, for the year 1887.

By order of the Commissioners.

H. H. THOMPSON,
Secretary.

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REPORT.

The Commissioners of Fisheries present herewith a report of their official operations for the year beginning December 1, 1886, and ending November 30, 1887.

The work of the commission may be subdivided as follows:

1. The management of the State fish hatcheries, and the original object of the creation of the commission, the artificial propagation of fish in the public and private waters of the State.

2. The superintendence of the game and fish protectors of the State.

3. Since June 16, 1887, the granting of franchises for purposes of oyster cultivation in the lands under the waters of the State.

The work of the Commissioners of Fisheries, in the artificial propagation of food-fishes has never been thoroughly understood or properly appreciated.

The majority of the citizens of the State, no doubt, imagine that the results obtained at the various hatcheries are mainly valuable as demonstrating scientific theories and of benefit only to those interested in pisciculture.

The fact remains, however, that no investment made by the State yields such a return, commercially speaking, as the appropriation made by the Legislature to the Commissioners of Fisheries.

Millions of the finest edible fishes are annually distributed in the various lakes, rivers and ponds of the State and the effect upon our food supply can not be estimated. Besides, experience has taught that the natural result of overfishing by the population of a thickly settled State means the rapid depletion of the number of fish in its waters and the consequent final exhaustion of the supply.

Artificial propagation is the only available remedy, and there can be no doubt, even at this date, had not the Commission of Fisheries been created many varieties of fresh-water fish in this State would have almost entirely disappeared.

Anything that tends towards a cheaper and better food supply for the people of the State deserves the greatest possible encouragement, especially at the present time when the tendency of wages is rather towards the minimum than the maximum, is such work of the utmost value and importance.

The detailed reports of the work at the various hatcheries will be found very interesting, and are given in the appendix.

Both hatching and distributing have been conducted very prosperously during the year. The hatch was unprecedently large and the distribution more general in the waters of this State than ever before.

The reports contain much valuable and important information in regard to pisciculture.

The commissioners therefore take great pride in the fact that the results obtained at the hatcheries for the past year are in excess of any previous year, and are in all respects so entirely satisfactory.

The following hatching stations were maintained out of the appropriation of $26,000, made by the Legislature for the purposes of the commission: Caledonia, Cold Spring Harbor, Adirondack, Clayton, Fulton Chain.

All these establishments are owned by the State, except those at Clayton and the Fulton Chain. These were built by private enterprise, but are operated out of the funds of the commission, and their profit is applied to public use.

The expenditures by the commission during the year have been $27,678.37.

Detailed statements of this expenditure will be found in the financial reports in the appendix.

The amount of fish fry distributed during the year is, in gross, 21,000,000. The tables following will show the production at each station:

TABLE OF PRODUCTION, 1887.

	Lake trout.	Brook trout.	Salmo farie.	Rainbow trout.	Salmo salor.	Land-locked salmon.	Shad.	White-fish.
Caledonia	2,408,000	1,208,000	307,000	946,000	.....	.....	3,882,000	897,000
Cold Spring Harbor	.....	145,946	39,985	8,000	242,150	36,950	2,644,000	950,000
Adirondack	395,000	196,000	.....	.....	245,000	25,000	.....	130,000
Fulton Chain	424,000	71,000	46,000	.....	.....	.....	.....	.....
Total	3,227,000	1,620,945	392,985	954,000	487,150	61,950	6,526,000	1,977,000

TABLE OF PRODUCTION, 1887 — *(Concluded).*

	Frost-fish.	Tomcod.	Smelts.	Loch-leven trout.	Saibling.	White perch.	Total.
Caledonia	.....	.....	.....	.....	.....	.....	9,648,000
Cold Spring Harbor	200,000	3,400,000	2,000,000	21,500	5,000	6,000	9,699,531
Adirondack	.....	.....	.....	.....	.....	.....	991,000
Fulton Chain	.....	.....	.....	.....	.....	.....	541,000
Total	200,000	3,400,000	2,000,000	21,500	5,000	6,000	20,879,531

The experiments that have been made with respect to the artificial multiplication of muscalonge have not yet advanced to assured results. Accurate information is still to be obtained in respect to the spawning habits of this fish before judgment can be formed as to its ultimate success.

The results of the last year's investigations will be found stated in the reports respectively, of Superintendents Seth Green, of Caledonia and M. B. Hill, of Clayton.

SHAD.

The shad catch in the Hudson river the last season was larger than it had been since 1880.

Mr. Matthew Kennedy, fish and game protector at Hudson, N. Y., reports: "I find that the catch of shad between Albany and Peekskill, far exceeds that of any of the past three years. The season was apparently short; lasting about thirty days."

Mr. R. O. Hetfield, reports: "From reliable and trustworthy information obtained from the fishermen, the season has been the most remarkable one for the past twenty-five years, as regards the enormous quantity of the catch; and the fine qualities of the fish. Notwithstanding the large catch, the season financially has not been a successful one for the fishermen. This was partly due to the tardiness of the shad, in making its appearance at the beginning of the season, owing to the cool weather, and the muddy condition of the water, caused by the freshets in the upper Hudson.

"But with the advent of warmer weather, the shad made their appearance in such immense schools, that it taxed the labors and resources of the fishermen to the utmost to convey them to market, and the consequent result was a larger supply than there was a demand, and natural falling off in prices.

"As an illustration of the wonderful catch, we will take the figures of a row of poles planted in midstream opposite Canal street, New York city. This row consisted of thirty-

two poles. The average catch for five days was 1,100 fish for two lifts daily."

Number of shad caught from the Hudson river.

On the upper Hudson, from Peekskill to Albany	385,100
From the lower Hudson, being from Sandy Hook to Peekskill	116,400
Total number of shad from the Hudson river, received in the markets of the city of New York, not enumerated in the above figures	1,067,134
Total catch of shad in the Hudson river, for 1887	1,568,634

It is worthy of notice that there has been a large increase in the number over last year, which, without doubt, is to be attributed to the persistent and systematic stocking of the river with artificially propogated shad.

In addition to the large increase in number there has been very marked superiority in the size and flavor of the shad taken this season.

A comparison of the shad hatch and the shad catch respectively for the last three years, shows a steady advance in both, as follows:

HATCH.	1885.	1886.	1887.
Spawn taken	1,575,000	2,510,000	4,457 000
Fry hatched	1,467,000	2,279,000	3,882,000

There was also deposited in the Hudson river 1,000,000 shad fry hatched at Cold Spring Harbor, from spawn furnished by the United States Commission. The amount hatched from the stock thus furnished was 2,644,000; 1,000,000 of which was deposited in the Hudson river, and the remainder in streams on Long Island.

FISH TAKEN.	1885.	1886.	1887.
In the upper Hudson	276,273	356,976	385,100
In the lower Hudson	102,750	89,050	116,400
Received and sold in New York market	796,312	854,923	1,067,134
Total	1,174,835	1,300,949	1,568,634

Netters and dealers were enabled by the abundance to place these excellent fish before consumers at a cost within the reach of the people of the humblest means. In this ability to furnish a large proportion of the people of the State with an excellent and wholesome fish supply, the wisdom of liberal public expenditure for fish culture, has been well demonstrated.

The law passed at the last session of the Legislature, requiring shad nets to be taken up one day in each week so as to permit a free run to the spawning grounds, is of no utility, as a clause was inserted in the interest of the lower river netters, confining its application to that part of the river above the northern line of Westchester county, where it is not needed, as the blockade is all below. Here, as in most cases where measures of public utility interfere with local or private interests, the power of the latter seems to be paramount in legislation.

THE ADIRONDACK HATCHERY.

The expectations of the commissioners in regard to this station have been fully realized. The accident to the water supply related in the commissioners report made in 1886, prevented any hatching the first year. The operations of the next season were satisfactory. Nearly a million of fry of the trout family were hatched and successfully planted. Among the number were 25,000 fry of the land-locked salmon, a fish upon which great exceptations

have been founded and will be in time realized. From trials that have been already made in Adirondack waters, it is established that this fish will thrive and multiply here as well as in its native waters in Maine and the coast provinces of Canada, which is its native habitat.

It was intended in the establishment of this station, that the trial should be made in the Adirondack waters, of obtaining all its spawn supply from the adjacent streams and lakes. This has been done with respect to brook trout the present year, with entirely successful results; 720,000 eggs of the brook trout, the yield of the adjacent wild waters, are already on the trays. A million of frost fish eggs, similarly obtained, are in the hatching jars; and 1,139,000 salmon trout spawn from the great upper lakes, have been secured; so that already the troughs and trays are taxed to their capacity without having to feed a single stock fish.

Great credit is due to James H. Marks, the capable superintendent of this station, for the indefatigable industry, earnest zeal and the careful economy with which he has conducted the business of the station.

CALEDONIA.

The work at this pioneer establishment is at its maximum. The ponds are full of vigorous stock fish, which yield not only all the spawn that can be handled in the hatching-house, but contribute largely to the supply at other State hatcheries, and of private ones which hatch for public distribution. The teeming production of the troughs make it necessary to utilize the outside waters, as nurseries for the fry that need to be kept till ready for distribution. These amount to several millions each year. But the waters are naturally adapted to this purpose. Caledonia creek, being actually one great spring coming from under limestone rock, has a temperature so nearly uniform all the year around that there is never any serious hindrance from freezing, and the fry may be daily looked over, and if necessary, fed in the screened boxes which are

anchored in the open waters. The manipulation of the spawn and fry is in the hands of skillful experts trained to the business by long experience and stimulated to well doing by a never failing enthusiasm. The report of the operations at this parent station will be found of more than usual interest from the large amount of work done and the uniform success with which it is attended.

The appropriation of $3,000, made at the last session of the Legislature, for the purchase of additionals lands, has enabled the commissioners to materially enlarge the grounds at this station and to secure a much needed frontage. This front is to be properly fenced and an ornamental gate-way provided; and as soon as the funds will permit, a suitable dwelling-house, for the use of the superintendent and other employes, will replace the present insufficient structure used for this purpose. These improvements will add not only to the utility of the station, but to its attractiveness. It has long been such an object of interest to visitors that in the pleasant months hundreds come daily to see the fish.

FULTON CHAIN HATCHERY.

The people interested in maintaining the fishing in the extensive waters of the northern wilderness, known as the Fulton chain, being the lakes and intervening waters of the main stream of Moose river, having built and equipped, at their own expense, a substantial hatching-house on the fourth lake of the chain, the commissioners, as they deemed, in proper recognition of this enterprise, put service in this hatchery late in the fall of 1886, and detailed for the work Edward M. Boehm, one of the most competent experts from Caledonia, and furnished it with a liberal supply of spawn from the parent stock of that hatchery.

The work was conducted with diligence and economy and was entirely successful. Some 500,000 of the fry of salmon and brook trout were hatched and planted in the Fulton waters on or about the fifteenth of March, under conditions favorable to successful stocking.

The stock of water, derived solely from a spring burst-

ing forth from a hill side, though sufficient in quantity for present operations, was not thought equal to what might be wanted for larger purposes contemplated. It was therefore decided to remove the buildings to the site of the old forge on Moose river, at the foot of the chain, where a State dam, holding back the waters of the entire chain, for the use of mills below, was available for a full and enduring supply. The removal was effected in the spring months, the building being placed on a mammoth raft and towed safely seven miles to its final destination. The guides aided with alacrity in this work, and the whole pecuniary cost was but $150. Connections with the dam referred to were conveniently made, some ponds for temporary use in spawning time were built and all was put in readiness for the coming hatching season. The hatchery now stands on land owned by the State.

Mr. E. L. Marks, a competent expert from Caledonia, is in charge for the present season and has succeeded at the date of this report in gathering from the wild waters accessible in the neighborhood, 300,000 spawn of the brook trout and 2,000,000 spawn of the frost-fish. There has been added to this stock, from the supply obtained by the Caledonia employes at the upper lakes, 400,000 salmon-trout spawn; which will give such a reinforcement of the stock of fish in the Fulton chain as will tend greatly to restore the former supremacy of these waters.

The success of this enterprise will, no doubt, lead to the establishment of similar hatcheries on important waters, such as Racquette lake and the Beaver river chain. The location of hatcheries built by private enterprise, aided by the State, in the heart of the great forest, will utilize spawn which would otherwise go to waste and open the way for a renovation of the fish supply at the lowest possible cost. There can be no question that fry hatched from spawn taken in wild waters, propogated in local hatcheries and planted in the immediate locality where hatched, are of four-fold value, compared with fry hatched at the State plants and transported at great risk to waters hundreds of miles away.

What has been done at the Fulton chain may be done at other places in the Adirondack country, where a renovation of the fish supply is called for. The benefits of stocking enures principally to hotel keepers, guides, sportsmen and other tourists, and there is no reason why this class should not bear a reasonable share of the expense. The fish interest of the Adirondacks is not so much a State interest as it is a local and personal one, and the cost of keeping it up should not fall altogether on the public treasury. Let the people most interested build the hatcheries, and the State hatch the fish for them. Better results will come of this community of interest than where the State bears all the expense and the locality derives all the benefit.

STATION AT COLD SPRING HARBOR.

The Legislature, at its last session, made an appropriation (chapter 613, Laws of 1887), for a new hatching-house at this station. The structures heretofore used were more than one hundred years old, rickety, leaky, and in no respect fit for the purposes for which they were used.

In accordance with the act making the appropriation, a lease has been executed by John D. Jones, owner of the site, to the State, for such term as it shall be used for the purposes of the hatchery, a contract has been made for the erection of a new, commodious and modernly equipped hatchery building, and the work is so far under way that it is expected hatching operations may be conducted in it in the present winter. This station needs a supply of stock fish, for which it has good provision in ponds already constructed, and when this want shall be supplied, its capacity will be equal to the needs of the southeastern part of the State. The waters of Cold Spring have been proved to be peculiarly adapted to the rapid and healthy growth of all the trout kind. And the facilities for salt-water supply are such that already lobsters and tomcods are propagated successfully and in large numbers. In the course of time, it is hoped, the work may be profitably extended to other valuable varieties of salt-water fish.

NEW STATION AT LAKE PLEASANT.

By the act, chapter 293, Laws of 1887, the commissioners were directed to establish, as soon as practicable, a State hatchery at Mill Creek, in the county of Hamilton.

The location is one which was officially visited by Commissioner Sherman in 1884, in his exploration for a site for a State hatchery in the Adirondacks, and is referred to in his report of that exploration, to be found at page 118, of the commissioners report, made to the Legislature in 1886. The commissioner reported that he found all the physical conditions in the Lake Pleasant country, in which Mill Creek is situated, favorable.

Preference, in the selection of a site, was given, however, to the place where the present Adirondack hatchery is located, as being a location where the work was more urgently needed.

The Legislature at its last session, passed the act referred to, requiring the establishment of a hatchery at Mill Creek, and placing the work in the hands of the commissioners. Some time was required in making the requisite local examinations and in the preparations of plans. When these were finally completed, bids were solicted by newspaper advertisements, for making the necessary erections. It was hoped that contracts might be made in time to secure the performance of the work before the spawning season, but no bids were offered, and so delay occurred until it was too late to attempt building the present season. A suitable dam and necessary connections for water supply were, however, made, and some work preparatory to building has been done. It is intended to get all the requisite material on the ground during the present winter and to have all arrangements provided for going on with the work in the spring season. The preliminary work already done has been under the direction of Mr. E. M. Boehm, of the Caledonia hatchery. From careful estimates made, the commissioners are satisfied the work can be completed in a proper manner within the appropriation. When the

hatchery shall be completed and put to its proper use, it is to be hoped that those in the Lake Pleasant region who have been heretofore so lax in the preservation of their fishing advantages, will turn over a new leaf in recognition of what has been done for them, and will cease the depredations on the spawning beds which have been so hurtful in the past.

GAME AND FISH PROTECTION.

The reports of the game and fish protectors annexed, will show what has been done in this department during last year. With a few exceptions, these officers have given vigilant and faithful attention to their duties and have been as successful as the circumstances permitted. The work reported is greater in volume and importance than that of any previous year, and the fact may be mentioned, as particularly showing an advance, that indictments have been lately found by a grand jury in Hamilton county, of residents of that county for violation of the game laws. Such an occurrence has hitherto been thought impossible. It has been the office of grand juries in that county to protect rather than punish offenders.

The protectors have been cramped in their work by the insufficiency of the allowance for expenses. This has been alluded to in former reports, and the remedy which has been suggested is now renewed, viz., that there should be an appropriation of $5,000 put at the command of the commissioners, to be expended in their discretion, in necessary measures to facilitate the enforcement of the law by the protectors. The present allowance of traveling expenses is twenty dollars and a fraction per month to each protector.

In the performance of a month's duty, which necessarily involves a good deal of travel, this sum by no means suffices, and the protector must not only take from his salary to eke out his official expenses, but must be without any means to pay for necessary aid. such as the employment of special detectives and other assistants and the hire of boats and other means of transportation essential

to the service. The additional allowance recommended should not be made in stated sums to every protector, but should be given by the commissioners, as needed for special occasions as they may occur. If the appropriation should not be all required, it would not be used.

The next greatest difficulty the protector has to encounter in the performance of his duty is the lax public sentiment that prevails in the principal game centers. The laxity is of the same nature as that which exists in regard to many other good laws provided for the protection of property and the maintenance of order and morality. The aversion of a community to the wholesome restraints of a law which bears upon the vicious appetites and propensities of any considerable class, has its bad influence on all local officers charged with the administration of the law. Under this influence jurors learn to disregard the obligation of their oaths, prosecuting officers become lax and unfaithful, and the evil effects extend often to the judicial bench itself.

It is difficult to make people understand, who live in the neighborhood of streams and lakes containing valuable fish, or of forests holding choice game, that the protection of this useful food supply from improvident waste is more their concern than it is that of people living remote and enjoying its benefits only on occasional and expensive visitations. The local class are generally as zealous to destroy the choicest game as they would be to destroy noxious animals. They take no heed of the ultimate consequences which must come of their ruthless spoilation, but look only to the wants or destructive pleasures of the day. They exemplify in the fullest sense the story of the goose that was killed for its golden egg.

The repression of the vicious spirit of destruction, can be effected only by means of law wisely framed to promote the end in view and faithfully administered by honest officers.

One of the greatest obstacles at present in the way of the enforcement of the game laws is the neglect, from disinclination of district attorneys to prosecute cases brought

by the protectors. This criticism is not meant to apply to the prosecuting officers as a class, for as a rule they are as faithful as any other class of public officers. But in most places where the public sentiment is bad, prosecuting officers lack zeal and independence. Thus it will be found that in the worst poaching localities, as Hamilton, Franklin, Lewis, Cortland, Otsego and some other counties, the number of offenders prosecuted to judgment is small compared to the number complained of. A case has has been reported to the commissioners where a present of venison taken out of season, was sent by the law-breaker to the district attorney of his county, and that officer, instead of promptly reporting the offender to the grand jury, wrote a note thanking the poacher for the meat.

In the larger counties, the pressure of business falling to district attorneys is so great that some must be necessarily neglected. The murder cases, of course, must have precedence, and the burglaries, robberies, arsons, rapes and the higher misdemeanors must be attended to; so offenses against the game laws, which are not esteemed as of as high a grade as they really are, are pigeon-holed and do not receive attention till business of supposed higher concern has been disposed of, Where a wholesome sentiment prevails, in counties less burdened with crime than those which contain the larger cities, the game law cases have better care, and there are some district attorneys whose prompt and vigorous action in such cases has made the law respected. But often, the best efforts of the protectors are set at naught by the lack of proper co-operation of the prosecuting officer. It is suggested, whether, in view of these considerations, it would not be good policy to make provisions for the protectors' cases, either by creating a separate department in the district attorney's office in counties where these officers are over-burdened with business, or by permitting protectors to prosecute suits through outside counsel.

How "not to do it," is well illustrated in a case stated in the report of Protector Drew, of his experience in Otsego

county. This report will be found in its place among the supplementary matter.

The protector spent many weeks time and not a little of his scanty personal means in looking up flagrant cases of violations that had been complained of by reputable residents of Otsego county, and after having, with much skill and pains, worked up some fifteen cases, in all of which he thought he had found ample evidence to warrant affirmative verdicts, he brought suits accordingly. They were all placed for trial on the calendar of the Supreme Court, when the judge, to relieve the pressure of an over-burdened calendar, with the consent of all the parties interested, sent the whole batch to the county court. Here, by some blunder, growing out of the incoming of a new district attorney, they were all knocked off the calendar, and a movement had to be made to the General Term to get them restored. Again they came on for trial. For some reason, which it is hoped the district attorney will be called on officially to explain, the cases, which had been prepared with great care by the late district attorney, were all withdrawn by his successor, without consultation with the protector. The effect of this singular proceeding, whatever may have been its motive, was most disastrous to the interest of protection. There had been for years in Otsego county more or less violations of the game law, but under stimulus of the protectors' efforts, there was a growing amendment, and offenses that had formerly been committed with impunity where now done only by stealth; but when the poaching fraternity found that the district attorney had, as it were, by a wave of his hand, let them loose from the law's shackles, practical anarchy set in. Spearing, netting and every device declared contraband by the law now ran riot on Otsego lake, and a week had not elapsed before the lake was fairly gutted. The situation is thus described by an eye witness at Cooperstown :

"The spawning beds have been swept clean, over 1,800 pounds of trout (not one of them weighing less than five pounds) being lugged off to Oneonta as the result of one

night's rascality, and bushels of spawn left rotting on the shore. Many of these fish, all of them utterly unfit to eat, being taken in the very act of parturition, were peddled through our own streets at ten cents per pound, and all besmeared at that, with spawn."

For fifteen years or more the Commissioners of Fisheries have been adding to the fish supply of Otsego lake, and have in that time planted over 1,500,000 salmon-trout. The fishing on the lake when the commissioners commenced to re-stock it, was at a low ebb, but at the time of the proceedings narrated, had become again very good, when by one day's bad work in the county court, the labor of fifteen years was undone and a blow struck at good order which tends to the lasting disgrace of the county.

As in the case of the bomb throwing at Chicago, ultimate good, however, is likely to come out of the evil. It is no longer popular to truckle to the poacher in Otsego. In view particularly of the late outrageous proceedings, the board of supervisors, have passed an iron-clad law, which forbids all fishing, except with hook and line for the space of five years in Otsego lake, and imposes the severest penalties on all violators. And it makes such provision for the trial of cases as will render possible, their conduct in the interest of justice. It is more than possible that the reformed sentiment which has followed the locking of the stable from which the horse was stolen, will sustain the law. But it cannot be expected of the commisioners, that they will do any more stocking in Otsego lake, till protection is assured beyond doubt.

The protective service has also suffered by reason of the uncertain tenure of the incumbents of the office. The official terms of all expired, some less than a year, but most of them more than a year ago. There are among the number some who should be retired on account of their age, which renders them unequal to the service demanded. There are others who have business avocations which interfere with the devotion of the time required, to the public service, who never ought to have been appointed,

because they have none of the special qualifications required for such service. The bulk of the force is good and efficient and those who have proved themselves competent and worthy should be reappointed, so that they may know what they are to calculate on for the next three years. The views of the commissioners on this subject have been communicated to the Governor, and their recommendations of the proper persons for appointment are before him. In the paper presented to the Governor, the following standard is laid down as the qualifications a protector should possess :

QUALIFICATIONS REQUIRED IN A GAME AND FISH PROTECTOR.

This office is one of trust and responsibility, calling for the exercise of diligence, vigilance, tact and much knowledge of men. The incumbent should possess the following stated qualifications:

First. He should be in the prime of life and in the full vigor of health.

Second. He should be of sufficient education to be able to draft concise reports of his operations to the board or head of department under whose supervision he acts, and to dispatch promptly his official correspondence.

Third. He should possess such tact and sagacity as will qualify him to cope successfully with the class of offenders it is his duty to look after.

Fourth. He should be of sufficient intelligence to work up ready for trial the cases where he shall commence prosecutions and to aid the district attorney in their conduct.

Fifth. He should have no other business or occupation which will interfere with giving his first attention always, to the duties of his office.

Sixth. He should recognize that he is accountable only to the law and to his official superiors for his acts, and while he should not decline advice from any source, when given in good faith, he should not permit himself to be influenced by outside organizations and persons who may

seek to control his movements for their own selfish purposes.

Seventh. He should have no bad personal habits, such as tippling, idling and debauchery.

In addition to these qualifications, that portion of the protectors' force assigned to service in the wilderness districts, should be experienced woodsmen, possessing a practical knowledge of the geography and topography of the region where their services are principally to be performed, able to follow foot-trails and woods-paths, and to travel by compass, and upon occasions to pack and cook their own subsistence and make their own camps. It is desirable too, that this portion of the force should have their own homes in the woods, at least during the season when they need to be on daily watch; and that they have no family or business ties to prevent their doing so.

RECOMMENDATIONS OF THE COMMISSIONERS.

It is presumed that the pressure of business before the Governor has been such as to prevent his giving this subject the consideration he would wish, and which he ought to give it, as to all cases where the responsibility of the appointment belongs to him.

But the Governor should be relieved of the responsibility of the appointment of these officers, and the protectors should receive their appointment from the board or head of department under which they are directly to serve.

What, from their observations, the commissioners would specifically recommend in the case, is that there should be not less than twelve protectors appointed for the whole State. That the appointing power should be either the Board of Commissioners of Fisheries, or some other appropriate head. That the choice should not be confined to prescribed localities, but that fitness should be the rule in the selection. That one of the protectors, and that one possessing the best qualifications, should be designated as chief protector, and the remainder should act under his orders. The pay and allowance to be as at present, except

that the chief protector should have $1,000 salary and $500 traveling allowance, and an appropriation of $5,000 should be made annually to be disbursed by the commissioners in payments at their discretion for such co-operative assistance and expenses as should be needed to give complete efficiency to the service. The tenure of office should be during good behavior. The appointing power should have authority to summarily remove any protector whom they should deem incompetent or unfaithful.

From such improved system the commissioners are certain benefits commensurate with the cost would ensue.

THE GAME LAWS.

The restoration of the six-inch-trout law, that is, the law which forbade the taking or retention of any brook trout less than six inches in length was wise. Without such a restriction, any attempt to restock the small trout streams of the State, which are the nurseries for the larger waters, would be practically futile. Animal life of every kind must be protected in the infant stage; this is the only alternative of extinction.

The repeal of the lobster law, so called, was a mistake. This law forbade the sale in our markets of infant lobsters. Under its workings, the undersized lobsters brought from the eastern coast, were dumped into New York bay, where in the course of time, they attained marketable size and added materially to the public supply. Now these small lobsters go immediately into consumption, and the consequence will be that in a few years there will be a scarcity of lobsters in the New York markets, of any size.

The commissioners repeat their former recommendation that a competent commission, made up from inside or outside the Legislature, be appointed to codify the game laws; not to introduce new systems, but to make clear, compact and consistent what is now vague, contradictory or impracticable.

The clearer and freer any statute is, of exceptions and reservations, the better chance there will be of its enforce-

ment. Much of the trouble with the Game Code as it stands at present, is, that it is liable to contrary constructions which enable weak-kneed or partial prosecuting officers and unscrupulous jurors to interpret them in the interest of the offenders.

OYSTER FRANCHISES.

For several years past surveys and other investigations have been in progress on Long Island sound, under direction of the Shell Fish Commissioner, Eugene G. Blackford, appointed by legislative authority, with reference to oyster bed rights, and to the full development of the oyster interests in the State. These surveys have been substantially completed, and a law (chapter 584, Laws of 1887,) was passed at the last session of the Legislature, empowering the Commissioners of Fisheries (with a new member, a practical oysterman, added), to formulate rules for the regulation of oyster farming, for the allotment permanently of the old beds to their rightful owners, and for the sale of lands under water suitable for oyster beds to such persons as may wish to plant new beds.

Under this act the commissioners have carefully made rules intended to secure an impartial disposition of the lands and to guard against combinations and monopolies in the oyster business. Their proceedings on the subject will be found at length in the record in the appendix.

As the business of this department is one that calls for daily attention, the commissioners have opened an office at a central point in New York city (room 110, fifth floor, Potter Building, Park Row), where their clerk, Mr. Edward P. Doyle, may be found daily (Sundays excepted), from 9 A. M. to 4 P. M. At this place, also, stated meetings of the commission are held on the first Monday of each month.

A more full account of what has been done, and what it expected to do, in this department, will be found in the report of the Shell Fish Commissioner.

ESTIMATE OF APPROPRIATIONS.

The amount of appropriation made for the uses of the commission has been, for the last three years, $26,000 annually.

This sum has sufficed for the support of all the hatching stations and for the necessary contingent expenses of the commission, which latter sum has never exceeded (including $800 salary to the secretary), $1,500 per year.

For the fiscal year ending September 30, 1888, the apportionment of this sum for the several purposes to which it is applicable, has been as follows:

For the Caledonia hatchery and for shad hatching on the Hudson river and spawn gathering at the upper lakes....	$13,000
For the maintenance of the Adirondack hatchery.....	4,500
For the maintenance of the Cold Spring Harbor hatchery..	4,000
For the hatchery of M. B. Hill at Clayton	1,500
For the hatchery at the Fulton Chain	1,500
For general contingent expenses	1,500
	$26,000

Since the passage of the last General Appropriation Act, a new hatchery has been directed to be built, as before stated, at Mill Creek, in Hamilton county. This establishment will be ready for service by the opening of the next fiscal year, and provision will be needed for its support. As it is to be an establishment second only in capacity to the Caledonia hatchery, and as its location is in the forest country where transportation and supplies are expensive, at least $4,000 annually will be required for its support. The total amount of appropriation which will be needed, therefore, for the next fiscal year, will be $30,000.

For the shell-fish department a separate appropriation will be needed, as follows:

For the engineer, from May 1 to October 1, 1888, an item in the supply bill is needed of $4,000.

For the same department, for the fiscal year ending October 1, 1889, an appropriation is needed of $5,500.

For the salary of clerk and incidental expenses, $3,500.

In all, $4,000 in the supply bill and $9,000 in the appropriation bill.

As a fee of twenty-five cents per acre is charged for the survey of oyster grounds, the money asked for by the engineer's department will, in a short time, be more than covered back into the treasury. In fact, as far as the entire appropriation for oyster work is concerned, the receipts from the sale of franchises will much more than balance the appropriation. There are 600,000 acres of available land for the greater part of which no less a price than one dollar an acre can be fixed.

Respectfully submitted.

R. BARNWELL ROOSEVELT.
RICHARD U. SHERMAN.
EUGENE C. BLACKFORD.
WILLIAM H. BOWMAN.
A. SYLVESTER JOLINE.

APPENDIX.

REPORT OF SETH GREEN,

SUPERINTENDENT

CALEDONIA STATE FISH HATCHERY,

TO THE

COMMISSIONERS OF FISHERIES,

OF THE

STATE OF NEW YORK,

FOR THE

Year Commencing Dec. 1, 1886, and Ended Nov. 30, 1887.

REPORT.

To the Board of Fish Commissioners of New York:

GENTLEMEN.—I herewith transmit my annual report of the hatching and distribution of fish from the hatcheries under my charge, and the expenses connected therewith for the year commencing December 1, 1886, and ending November 30, 1887:

CALEDONIA HATCHERY.

The Caledonia hatchery is at present in fair working order, and several improvements have been made which are both advantageous and useful. During the past summer and autumn we have by the consent of your body erected a new ice and meat house, which were much needed, the old ones having served past their usefulness. The buildings erected are plain and substantial, and well adapted to the purposes for which they are intended.

By the recent purchase of certain lands adjoining those already owned by the State, we have been enabled to clear up a small grove, which adds greatly to the appearance and attractiveness of the grounds, and also to better control the water supply of the creek without fear of encroaching on other people's rights. The purchase has also given us an undisputed right of roadway to and from the grounds, and we shall be able to put the frontage in a presentable shape, which has heretofore been the cause of much unfavorable comment from those who have had occasion to visit the grounds.

The acquisition will give us additional space for the construction of more ponds, if necessary, and from time to time make other improvements of value.

SALMON-TROUT.

By reference to the appended table of distribution it will be seen that the total distribution of the fish and eggs of this variety amounted to 3,463,000 which exceed by 450,000 the largest previous distribution, which was in 1884, during which season we sent out a total of 3,013,000.

The distribution of the fish was begun by the commission in the year 1870, and continued each year since, during which time a grand total of 22,363,000 have been turned into the waters of New York

State. This branch of the work has been attended with most excellent results, and is without doubt one of the most valuable and important departments in the work of the Fish Commission. Many waters which had been practically depleted now abound with them, and also several waters which did not previously contain them have been successfully stocked. Of their great value as a game and food fish their merits are too well known to demand of any elaboration on my part.

There is one particular point of value, in connection with the introduction of this fish in the inland lakes, which is deserving of special mention as set forth by Mr. A. N. Cheney, of Glens Falls, N. Y. Under date of March 31, 1887, Mr. Cheney wrote me a letter from which I take the following.

"I have trolled Lake George for seventeen springs except one that I was away and one that I was sick, and I know that the lake trout were steadily decreasing until the State began to stock it, and now it is steadily increasing in its catch and every year there is a stronger evidence of this fact, I am more and more a believer in the introduction of fresh blood in our waters. By this I mean a cross with the same species rather than constant in-breeding.

The trout of Lake George have been growing larger since the native trout has been introduced to their relatives from Lake Ontario and Huron. The first trout we put into Lake George seventeen years ago last month." Of the truth of this statement there is scarcely room for doubt.

BROOK TROUT.

The preserves of the Caledonia hatchery are now well filled with this beautiful and much sought after fish and will be more so during the coming year. We have been more than usually successful in rearing a large stock of the young fry and will undoubtedly be obliged to increase our facilities to accommodate them. We have now 30,000 young fish, nearly a year old, which will in due time enable us to more than double any previous output of young fry during a single season.

Of the value of the distribution of this fish by the commission the constant and growing demand for them is the best possible proof. There has scarcely been a season since the work began, in the year 1876, twice as many as we have been able to produce could not have been used advantageously. I am constantly in receipt of the best of reports concerning the increase of these fish in the waters where they have been deposited and protected, and of the great value the replenishing of the waters has been to the localities whose inhabitants had the foresight to take advantage of the means offered by the commission to replenish their supply.

WHITE-FISH.

Since the issue of the last report we have distributed 1,000,000 of the young fry, mostly in the waters of Lake Ontario.

The demand for this fish for the purpose of stocking inland lakes is not great. Parties who have applied for them have done so for the purpose of placing them in the waters for food for the lake trout.

As they cannot be readily taken with hook and line, and as any other means of capturing them in the inland waters of New York State is unlawful, and if allowed would result disastrously to the other inhabitants of the waters, I cannot say that we are justified in attempting to hatch them in any considerable numbers for such purposes.

There can be no doubt, however, that if a properly equiped hatchery could be located at some favorable point on Lake Ontario that the hatching of this fish, as carried on by other States, most notably Michigan and Ohio, would result in greatly benefiting the waters thereof.

CALIFORNIA TROUT.

While the success of the distribution of this fish cannot in all respects be said to be as gratifying as could be desired, the work has been far from a failure, and from reports that I have received I find that they are now flourishing in many waters throughout the State. The chief difficulty with them appears to be that when they reach the age of two years they are inclined to depart from the small streams in which they were originally placed to the larger waters or rivers into which the brooks flow. This, as a matter of course, cannot be of much encouragement to those who have gone to the expense and trouble of depositing them, and consequently the demand for them has somewhat fallen off, although we last season sent out a total of 1,382,000 fry and eggs, as will be seen by the appended tables.

In accordance with the demand, I have reduced the supply of breeding fish, so as to lessen the expense in caring for and feeding them, but as there is stated above, many waters in which they appear to do well, I think it advisable to keep a stock on hand sufficient to supply those who wish.

The first distribution of them in any considerable quantity was in the year 1881, and therefore I do not consider that sufficient time has yet elapsed to thoroughly test the matter, and I have a strong belief that they will prove themselves of considerable value to the waters of our State, considering their extraordinary hardiness and game qualities.

BROWN OR GERMAN TROUT.

In regard to this fish I have to report that there is every indication up to the present time that they will thrive in our waters. We began distributing them in 1885, and next year we shall undoubtedly hear from them.

They are hardy, thrive well in the waters of Caledonia creek, are not difficult to raise and are without doubt a valuable fish for our waters and equal to the native speckled trout. We are raising a fine lot of the young fish and will, in the course of the next two or three years, be in shape to furnish a liberal supply to all who may desire them.

The following article, published in the issue of the *American Angler* of September 24, 1887, which was written in reply to inquiries received concerning them, will, without doubt, explain my views in regard to them fully as well as anything I should now write. I therefore take the liberty of reproducing it:

GERMAN TROUT IN AMERICAN WATERS.

I am having quite a good many inquiries concerning the German or brown trout as to the probability of their success in the waters of the State of New York. For the benefit of the interested readers of *The American Angler*, I will say that as yet it would be impossible to give a positive opinion in regard to the matter, as we have had scarcely sufficient experience with them to know just how they are going to plan out or which of our waters they will thrive in the best, but from all present indications it would appear that they will do well in any of our spring streams, and so far as our experience goes they will thrive in the same waters with our native speckled trout. From the fact that they grow more rapidly and apparently to a greater size than our speckled trout, I am inclined to the opinion that they should not be placed in the smaller of our brook trout streams, as there would not be sufficient food for them and in that case they would naturally reach that point of hunger where they would feed upon the brook trout. If placed in the larger streams where the food was more abundant and a greater range of territory for them, I can at present see no reason why they will not do well.

It is now over four years since we deposited the first lot in Caledonia creek and they are there yet and of good size. We sent out the first lot to other waters in this State a year ago last spring, but as yet have had no report from them, but shall expect to when the fishing season opens next spring, as they will then be past two years old and large enough to take.

My impression is that they are going to be an excellent fish for the speckled trout lakes in the northern part of the State, especially those that have small spring streams flowing into them in which to place the young fry, as in such waters there will be ample food and plenty of room for them. To such waters they will without doubt be a valuable addition and an agreeable surprise to the fortunate angler who is lucky enough to hook and land them.

As a pond fish they are easy to raise, are good feeders and stand confinement well. We have some in our ponds raised from the egg, which will weigh without doubt three pounds. There is no fish in the ponds at the Caledonia hatchery which presents a finer or more healthy appearance and I shall be disappointed if we do not get a large take of spawn in proportion to the number of fish we have.

On the whole I think the outlook for the success of the German trout in the waters of this country is very favorable, and as they are a very beautiful and gamy fish, and equal to any of the trout family of this country as a table fish, it is earnestly to be hoped that there may be no pull-back to their thorough establishment in our waters.

SETH GREEN.

ADULT OR BREEDING FISH.

Under this heading are the black bass, Oswego, or big-mouthed bass, rock bass, wall-eyed pike or pike, perch, yellow perch and bull-heads.

These varieties we have distributed continuously each season since the organization of the commission and with more than satisfactory results, many waters now containing them in abundance in which they were previously unknown. This branch of the work has been conducted with small expense annually, and in proportion to the outlay has been one of the most valuable under my charge.

The adult fish have been captured in the wide waters of the Erie canal near Rochester, N. Y., in the spring of the year and sent to the waters for which they were required without cost of constructing ponds or feeding them.

We have for the past number of years met with considerable opposition in carrying out this work from the local anglers, and the feeling appears to be quite strong that we should not continue to net the fish for this purpose; but from my own experience in this matter, extending over a period since the formation of the canal, I am positive that the fish in these waters are better protected and actually fewer fish netted now than before the commission began taking a few hundred for distribution during a few days in the spring of the year. From knowledge gained last summer I am of the opinion, however,

that more fish can be obtained for this purpose at the lower end of Lake Ontario much easier and at no greater expense than from the wide waters, and therefore I think it advisable to make our distribution from that quarter next season.

SHAD.

The department of shad hatching is still greatly hampered by the greed of the fishermen in almost completely barricading the river with nets and the non-observance of the close-time, so that it is impossible for the adult shad to reach the head waters of the river in any considerable quantity. We have, however, been able to turn into the river for the past few years from two to four millions annually, which is the means of keeping up the supply and making the Hudson, without doubt, the largest shad producing river in the world. Last season we deposited in the Hudson 3,822,000 strong and healthy fry, which is an increase over any season since 1883. This number is not one-tenth of what we would be able to hatch provided the spawning fish could be obtained with which to operate. It is much to be regretted especially so considering that from past experience we have positively demonstrated the great value of artificial propogation and that the Hudson could actually be made to swarm with this unexcelled food fish and at such incomparably slight expense.

The law passed at the last session of the State Legislature providing for a close-time each week, from sunset Saturday night till sunrise the following Monday morning, is practically a dead letter, as it provides only that shad shall not be taken from the Hudson river during that time above the northern boundary line of Westchester county.

Nearly if not quite all of the great number of stake-nets, which are the ones which take the most fish, are located below this line and consequently the law does not interfere in the least with them. They are the principal and greatest barrier to checking the progress of the shad while pursuing their upward course to the spawning grounds.

It is earnestly to be hoped that some way may be devised to remedy this evil.

MUSCALONGE.

At the earnest solicitation of Mr. George S. Tuckerman, of Jamestown, N. Y., from whom I had received assurance that muscalonge in a ripe or spawning condition could positively be obtained from Chautauqua lake, Chautauqua county, N. Y., for the purpose of trying the experiment of propagating them artifically. I therefore deemed it expedient to send Mr. Jonathan Mason to make the attempt, accordingly Mr. Mason started for Jamestown April 27, 1887, where he was

met by Mr. Tuckerman who accompanied him to Mayville, where they were taken in charge by Mr. E. S. Irwin, a gentlemen who has been a close observer of the habit of the muscalonge in Chautauqua lake for many years.

As Mr. Irwin had no way of catching the fish it was thought advisable to procure some gill nets, with which to catch a sufficient number to try the experiment. The nets were obtained and set in seven or eight feet of water for four days and visited every few hours, during which time but three male fish were captured. I then advised Mr. Mason that if no other way could be devised to catch them other than with gill nets, which was sure death to all that came into their meshes, that he had better stop as the probability was that many fish might be destroyed without accomplishing the desired object, and I directed him to look up some ground where they might be taken with a seine. He accordingly on the fifth of May went down the lake five miles, where he had been informed that there were favorable grounds, and looked them over and came to the conclusion that if they were properly cleared up, which could be done with little work, that a good seining ground could be made where a number of muscalonge might be caught and the experiment tried in a satisfactory manner.

Messrs. Tuckerman and Irwin rendered Mr. Mason all the assistance in their power for which they are deserving of much credit, and the failure of the attempt was not due in any sense to lack of attention on their part.

From the experience gained this season I think it would be advisable to make another attempt next season, as it can be done with but little cost and if successful would be of great value. The total expense incurred by Mr. Mason was $27.69, and it is not probable that another experiment would greatly exceed this.

FULTON CHAIN HATCHERY.

In accordance with a resolution introduced at a meeting of your commission by Commissioner Sherman, held in New York December 6, 1886, in which this hatchery was put in my charge, I dispatched Mr. Jonathan Mason, one of my assistants, to put the hatchery in shape for hatching purposes.

The hatchery building which had been erected on Fourth lake of the Fulton chain, by the Boonville Sportsman's Association, and donated to the Fish Commission on condition that they equip and maintain it, was found by Mr. Mason, who arrived there December 10, 1886, to be in fair condition, but requiring considerable labor to put the hatching apparatus in shape for practical use. This was done

with as much haste as possible, and on December twentieth, I started Mr. E. F. Boehm with a stock of spawn consisting of 565,000 of salmon-trout, brook trout and German trout. Mr. Boehm remained there during the winter and hatched the eggs, and distributed the fish successfully, as shown in the appended report. The water supply was found to be inadequate to properly fill the trough capacity of the house and extend operations, and it was therefore deemed necessary to remove the building to a site at the Old Forge at the foot of First lake, Fulton chain, as this point was considered the best adapted for the purpose, and an unfailing water supply with ample fall could be obtained by conducting it from the State dam at this point.

On June 20, 1887, by the consent of your board, I sent Mr. E. F Boehm to superintend the removal, which he accomplished successfully with the assistance of the guides. Mr. Boehm put the building in proper shape, and returned from there July twenty-third. The hatchery building is one story high, and twenty feet wide by forty feet long, with a dwelling appartment attached at one end, extending the width of the building, and eleven feet wide, in which the men kept batchelors' hall. It is equipped with twelve hatching troughs fourteen feet long, having a capacity of 2,000,000 of brook and salmon-trout spawn, and twelve chase jars for hatching frost-fish spawn. This fish is highly prized by the guides and inhabitants of the wilderness, even being preferred by them to trout.

I have this season placed the hatchery in charge of Mr. E. L. Marks, one of my most experienced men, who reports to me (November 15, 1887) that he has succeeded in obtaining nearly 300,000 speckled trout spawn from the trout in the waters of that section, and over 1,000,000 frost-fish spawn. In addition to these, I shall send from the Caledonia hatchery a good supply of salmon-trout and German trout spawn.

The success of this branch hatchery is unquestioned, and the great area of water that can be easily reached from this point, renders it well worthy of the attention and continued maintenance by the commission.

MILL CREEK HATCHERY.

At a meeting held in New York city July 25, 1887, the following resolution was passed:

"*Resolved*, That the hatchery directed by chapter 293, Laws of 1887, to be erected at Mill creek, a tributary of Round lake, in Hamilton county, be located at such point on said stream on lands belonging to the State, in the town of Lake Pleasant, as shall be selected after personal examination by Superintendent Seth Green of the Caledonian hatchery, with the approval of the majority of the commissioners, and

that the said superintendent be directed to proceed immediately to Lake Pleasant, and make the necessary examinations touching said site; and that he be further authorized to prepare plans for the hatchery buildings, and to advertise for two weeks in one newspaper each in Fulton and Montgomery counties for bids for the work, including all materials and labor required thereon, and to report such bids to the commission, the contract to be awarded to the lowest responsible bidder who shall give satisfactory security of the faithful performance of his contract within a time to be specified therein. That the work of preparing the grounds, building a dam, making the necessary connections with the hatchery, the construction of the troughs and other hatching apparatus and necessary improvements of roadways be done under the directions of said superintendent, or of such person as may hereafter be appointed by the commission as local superintendent, and that the sum of $1,000, or so much thereof as may be necessary, be paid out of the appropriation made by chapter 293, Laws of 1887, for such last specified purpose, provided, however, that no contract shall be let for the erection of the buildings till the owners of lands in Township No. 9 adjoining the State lands upon which it is proposed to erect the hatchery shall convey to the State for the purposes of the hatchery so much of said lands as shall be necessary to give control of Mill creek from the hatchery site to its source."

In accordance with the above, I left Rochester August 4, 1887, in company with one of my assistants, Mr. E. F. Boehm, We reached Fonda, N. Y., at 4 P. M. where we were met by State Senator Edward Wemple, through whose instrumentality the necessary appropriation was granted the commission for the purpose of constructing and equipping the building. Senator Wemple remained with us for the remainder of the trip. From Fonda we went by train to Northville, the terminus of the Johnstown and Gloversville Railroad, from there we took a carriage and drove to Wellstown, about sixteen miles distant, and stopped over night. The following day we drove to Lake Pleasant, about fourteen miles from Wellstown, and changed our conveyance at Sturges' Hotel for a buck-board as the balance of the journey was so extremely rough that no other kind of a vehicle could possibly make the journey and come out whole. We at last reached Mill Creek, and I proceeded at once to make and examination of the stream to select the most favorable locality, and after due deliberation selected a site at a point on the north side of the creek about four miles above the outlet where it empties into Round lake. At this point a saw-mill was formerly located, and was strongly recommended to me by Commissioner Sherman, who has visited the locality, and to

whom I am much indebted for many points of value given me before starting thereby making the undertaking much less laborious.

The site selected is an excellent one and, in fact, a natural one for the location of a hatchery. By building a dam four feet high and twenty feet wide we shall get a fall of from twelve to eighteen feet in about 200, and by taking the water through an iron pipe and conducting it to the hatchery the location will be such that there will be no danger from injury to the buildings at the time of freshets. Mill creek is a rushing, roaring, dashing stream, with an abundance of pure, cold water. The temperature of the stream August fifth was sixty-five degrees Fahrenheit. The stream now contains a great many trout and, I think, by making the proper arrangements many spawn can be obtained from the trout there. I found the natives of that section extremely hospitable and much interested at the prospects of a fish hatchery and willing to aid the project in any way in their power.

The supervisors and highway commissioners have agreed to improve the road leading to the hatchery at once, which will greatly facilitate the work. September first I dispatched Mr. E. F. Bohem to Mill creek for the purpose of clearing up the site for the hatchery, improving the roadway, constructing the dam, and placing the iron pipe in position for feeding the hatchery. This work has been performed in a thorough and satisfactory manner and the grounds are now ready for the erection of the building.

I have had the plans and specifications drawn up for the hatchery building and advertised for bids, as directed by your board. I have as yet received none, but the work of drawing in the timbers and preparing them will be done this winter, so that the work can be commenced as soon as the weather will admit in the spring and pushed to completion as speedily as possible.

The plans, in brief, provide for a frame building, with a gambrel roof, two stories in height, forty-five feet long and thirty-five feet wide. The first floor will be fitted out with all the necessary appliances for hatching fish eggs and will have a capacity for holding, if necessary, about 8,000,000 of trout spawn. The second floor will be arranged for dwelling apartments for the local superintendent and his assistants.

CONCLUSION.

In concluding my report I have taken the liberty of appending a few letters which I have received from time to time during the past year.

Respectfully submitted.

SETH GREEN,
Superintendent.

ROCHESTER, N. Y., *December* 1, 1887.

COMMUNICATIONS.

BISBY, *May* 16, 1887.

SETH GREEN:

DEAR SIR.— I have some good news for you. One of our men going down to the Second lake yesterday reported on his return that he saw in the outlet several large speckled trout, apparently of two or three pounds weight. Further examination to-day show them to be *rainbow trout*, looking for spawning places. The dam at the foot of the Second lake went out last week, and the water in the outlet, which was before deep and sluggish, is now rapid and clear, showing a fine sand and gravel bottom, which seems to suit these fish. A female rainbow was taken to-day at the foot of Chamler lake falls, which weighed, after she had been stripped of a half pint of spawn, *three and one-half pounds.* She was of the stock hatched here three years ago, and put in Chamler lake. An effort was made at the falls to take some males to impregnate the spawn of this fish, but it was upwards of half an hour before any more were taken. Then a male was caught, weighing something over a pound, but on examination he proved to be a spent fish. Another was caught soon after and the milt stripped upon the spawn, but it was probably too late for impregnation. We shall set the eggs, however, and see what will come of them. The large female was twenty-one inches long and four and one-half deep. This is the first instance, I believe, of the discovery of rainbow trout this side of the Rocky mountains spawning in wild waters.

We shall make an effort to get spawn from these fish, and I think it would be well, also, if you would send us 15,000 or 20,000, they do so well here. We have not yet got done our distribution of brook trout. We hatched full 150,000 out of 165,000 eggs, and more lively or vigorous fry were never seen. The little imps are darting after flies before the yolk sac is off. Some of them were six months in hatching.

Truly.

R. U. SHERMAN.

WHITE LAKE CORNERS, N. Y., *May* 24, 1887.

SETH GREEN:

DEAR SIR.— I have your valued favor of the twentieth. Since I wrote of the discovery of the spawning rainbow trout we have made another discovery on the subject that is still more satisfactory. We have found these fish far up a little inlet of Chamler lake, where there

was hardly enough water to cover them, *in pairs*, and have taken the spawn, impregnated it with the milt of the male fish, and now have it on trays in our hatching house. The number of spawn taken is about 5,000. We did not make the discovery till the season was nearly over, as on our last visit they had all disappeared, and had probably returned to the lake. We shall look for the fry in the stream next month, and as there are no other fish of any kind in it, do not doubt that they will do well. Two important facts have been established: 1st. That the rainbow trout will remain in the waters where they are planted, as these have remained three years when they might any day have passed to waters below. 2d. That their spawning habits are the same as the salt-water salmon; they will, when they have the opportunity, ascend as high as they can go in the small spring streams to cast their spawn. These fish are probably a species of the salmon, which has become to some extent land locked.

We cooked the three and one-half-pound fish, spoken of in my last letter. It was flaky like *salmo-salus*, of a deep pink color, and had the twang of a salt-water fish. The larger they are the more they show a resemblance to the true salmon.

The season of shoal-fishing here (for the Bisby or salmon-trout) has been very brief. It usually commences a week or ten days after the in goes out, and lasts to the tenth or fifteenth of June; but it is evidently over for this season, and the fish have descended to the depths, where we must seek them by buoy-fishing or trolling. The reason for this early departure from the shoals is probably the long spell of warm and dry weather, unusual here at this time of the year, which has raised the water to an unusual high temperature.

The brook trout of this lake have hardly arrived at good condition yet. What we have caught are thin and shiny. About the first of June we expect they will be in good order and lively for sport with the fly. The water being unusually low on the river, there is good fishing on the riffs, where the trout are present, probably to clear themselves of winter slime.

The success of the shad fishing this spring is very gratifying and ought to convince all doubters of the policy of continued artificial production.

Yours truly.

R. U. SHERMAN.

NEW YORK, ONTARIO AND WESTERN RAILWAY COMPANY,
SUPERINTENDENT'S OFFICE—MIDDLE DIVISION,
MIDDLETOWN, N. Y., *March* 10, 1887.

SETH GREEN, ESQ., *Superintendent N. Y. State Fish Commission:*

DEAR SIR.— In answer to your letter of February sixteenth, referring to improvement of fishing by restocking streams along line of Ontario and Western, I inclose copy of letter from Mr. Babcock, formerly road-master of this company. Mr. Babcock has been familiar with our trout streams for a number of years. I understand from him and other fishermen that the fishing was never better than last year.

Very truly yours.

E. CANFIELD,
Superintendent.

NEW YORK, ONTARIO AND WESTERN RAILWAY COMPANY,
WALTON, *February* 23, 1887.

Mr. E. CANFIELD, *Division Superintendent:*

DEAR SIR.—Yours received, asking about the trout streams in this vicinity.

We commenced putting in trout from the State hatchery about eight years ago. At that time the trout in Delaware and Sullivan counties were getting to be very scarce. Although all the brooks are natural trout streams, the water cold and all right for trout, they were over-fished. I saw the difference the second year after State trout was put in. The fishing was much better, and the more trout was put in, the better the fishing.

For three years we put in California trout in the east and west branches of the Delaware, and the Beaverkill and other tributaries; but this was a mistake. They came back the next year after we put them in, and then was gone. The water did not suit them, apparently. I have heard of them down the river, where the water is deeper.

Since we left off getting California trout, we have kept putting in the brook trout, and find the fishing getting better every year, so much that we find the fishing getting better in the main rivers—that is, the east and west branches of the Delaware, and the lower part of the Beaverkill. In the rivers we have for the past two years caught a great many large trout. Especially, early fishing is good, and the trout large.

I am satisfied that the State fish put in has done a great deal of

good, and I am satisfied we must keep putting them in every year if we expect to have good fishing.

Last year we put in about 3,000 German trout, in the headwaters of Third brook, a tributary of the Delaware. I have not heard of them since last fall. They were getting along then.

I must say that this part of the country has been greatly benefited by State trout; and long life to Seth Green.

Yours truly.

J. BABCOCK.

SHERIFF'S OFFICE, ONTARIO COUNTY,
HIRAM PECK, *Late Sheriff*,
PHELPS, N. Y., *December* 9, 1886.

SETH GREEN:

DEAR SIR.—Will you please send me some application blanks. I wish to obtain some California and brook trout to stock some spring brooks in this town that empty into the outlet of Canandaigua lake. I have, for the past three years, obtained from the Caledonia fish hatchery several cans of California trout and stocked the same brooks and the past season quite a large number of trout have been caught from the outlet for several miles below here, some of them weighing about two pounds. The outlet through this town, and for several miles below here, is fed by a large number of spring brooks and I think there is no better place to put them in this part of the State.

Respectfully yours.

HIRAM PECK.

OFFICE OF H. D. GRANT,
BOONVILLE, N. Y., *March* 30, 1887.

Hon. SETH GREEN, *Superintendent State Fisheries:*

DEAR SIR.—Some days ago I read a letter from Commissioner Sherman, saying that at a recent meeting of the Fish Commission, held at Albany, you were authorized, in your discretion, to remove the Fulton Chain hatching-house to the Forge, and appropriating $150 for that purpose.

At the time I assisted Mr. Mason in putting the plant in readiness for the spawn, I became convinced, through his representations of what was necessary for its successful operation, that it would have to be removed before it could be run to its fullest capacity, and I wrote Mr. Sherman two months ago to say that in case the expert who had

charge of the hatchery should find the water supply insufficient, and it was thought best to change the location, that I would do what I could to have it done.

In many respects the Forge is the best place for it, though I didn't think so at the time of building. At the Forge it would be accessible at all times, and you would have all of the low temperature you want. Had it been located there at first, we could have put it in operation a year sooner.

As to what has been accomplished by restocking on the Fulton chain, I would say that we have had the very best results from it. Twelve years ago the fishing on the lower Fulton lakes was very poor. During the past ten years we have put in from 100,000 to 200,000 salmon and speckled fry each year, and as a result during the past three years the fishing has been nearly equal to what it was thirty years ago, and the fishermen have increased by many score; whilst the Racquette waters, which thirty years ago were the most famous in the State for salmon and speckled-trout fishing, are now nearly, if not quite, barren. No planting of these species has ever been done there. The best test we have ever had was the planting of about 1,500 salmon fry hatched at the Forge seven or eight years ago and put in Lime-kiln lake, which lies three miles south of Fifth lake on Fulton chain, and covers an area of 700 or 800 acres. Two years ago the fish would weigh from five to eight pounds, and were of a most delicious flavor. No salmon were ever caught there before this planting.

Very respectfully, etc.

H. D. GRANT.

REMSEN, *January* 21, 1887.

Hon. SETH GREEN, *Caledonia, N. Y.:*

DEAR SIR.— Will you please send to me a few blank applications for fish? The last season was the best for fishing in five or six years, the fish that were put in two or three years ago making the change, no doubt.

Respectfully.

O. S. EVANS,

Remsen, N. Y.

NEW YORK, ONTARIO AND WESTERN RAILWAY COMPANY,
GENERAL MANAGER'S OFFICE,
NEW YORK, *December* 29, 1886.

SETH GREEN, Esq., *Rochester, N. Y.:*

DEAR SIR.—I beg to acknowledge receipt of your favor of December twenty-eighth for which please accept my thanks.

Ever since I have been with this company I have used every endeavor to assist in stocking the streams along this line, and with what success you can judge from the fact that the oldest inhabitants say that the fishing is much better now than it was twenty years ago. A good many parties along the line have already made inquiries as to what the company was going to do to assist them in the fish business this season, and to all have said I should be glad to furnish them with free transportation for the fish and a pass for a man to accompany them. With many thanks for your kind coöperation in the matter, I remain,

Yours truly.

J. E. CHILDS,
General Manager.

POST OFFICE, WARWICK,
ORANGE CO., N. Y., *December* 13, 1886.

SETH GREEN, Esq., *Superintendent:*

DEAR SIR.—Will you kindly mail me blank applications. I desire to secure some trout fry for public waters in the spring. I had some from you six or seven years ago. They turned out very much better than I supposed they did at first, as we have had better trout fishing here for the past three years than before in ten years.

Respectfully yours.

B. F. VAIL.

WELLSVILLE INSURANCE AGENCY,
C. L. FARNUM & SON, Agents,
WELLSVILLE, N. Y., *December* 14, 1886.

SETH GREEN, Esq., *Rochester, N. Y.:*

DEAR SIR.— Please book our order for 50,000, or as many as you can spare us, of brook and German trout, for the headwaters and tributaries of the Genesee river. I see in our spring cove this fall upwards of 100 brook trout on spawning beds ranging from four ounces to one pound each, and that within two miles from Wellsville. In the same place during the summer I have went out after supper and taken from one-half dozen to one and a half dozen trout, ranging from six to eighteen ounces each, and done it many times the past season. I am satisfied it is the result of stocking. We do not get much result from the California trout. Think they run down the river, as we hear quite often of their being caught fifteen to twenty miles below us. Think the river is not large enough here to suit their fancy. The commissioners report came duly to hand, for which please accept thanks.

Yours truly.

G. EUGENE FARNUM.

REPORT

OF

DISTRIBUTION OF FISH

FOR 1887.

DISTRIBUTION OF SALMON-TROUT, CALEDONIA HATCHERY, 1887.

DATE.	No. of fish.	Lake.	County.	By whom ordered.	P. O. address.	By whom delivered.
Feb. 12,	20,000	Ontario	Monroe	Seth Green	Rochester, N. Y.	J. Mason.
Feb. 14,	50,000	Rye	Westchester.	A. L. Squire	White Plains, N. Y.	F. Redband.
Feb. 17,	25,000	Ravan	Lewis	R. J. Richardson	Lowville, N. Y.	J. G. Roberts.
Feb. 21,	75,000	Hemlock	Livingston	W. H. Pierce	Springwater, N. Y.	J. Mason.
Feb. 21,	50,000	Loon	Franklin	Fred W. Chase	Loon Lake, N. Y	F. Redband.
Feb. 23,	150,000	Lake George	Warren	R. S. Coleman	Sandy Hill, N. Y.	J. Mason.
Feb. 24,	100,000	Owasco	Cayuga	J. A. Clary	Auburn, N. Y.	J. G. Roberts.
Feb. 24,	25,000	Pine	Oneida	Dr. C. M. Hitchcock	Utica, N. Y.	Dr. C. M. Hitchcock.
Feb. 28,	36,000	Woodhull	Herkimer	Hon. J. K. Brown	Albany, N. Y.	J. G. Roberts.
Mar. 3,	60,000	Ontario	Niagara	Hon. David Miller	Lockport, N. Y.	J. Mason.
Mar. 3,	85,000	Silver	St. Lawrence	Hon. N. M. Curtis	Ogdensburgh, N. Y.	E. L. Marks.
Mar. 7,	85,000	Big	St. Lawrence	Hon. N. M. Curtis	Ogdensburgh, N. Y.	J. G. Roberts.
Mar. 7,	85,000	Clear	St. Lawrence	Hon. N. M. Curtis	Ogdensburgh, N. Y.	F. Redband.
Mar. 10,	105,000	Owasco	Cayuga	J. A. Clary	Auburn, N. Y.	J. G. Roberts.
Mar. 11,	115,000	Kenka	Yates	Geo. S. Weaver	Albany, N. Y.	E. L. Marks.
Mar. 14,	115,000	Kenka	Yates	Geo. S. Weaver	Albany, N. Y.	E. L. Marks.
Mar. 15,	115,000	Kenka	Yates	Geo. S. Weaver	Albany, N. Y.	E. F. Boehm.
Mar. 16,	115,000	Kenka	Yates	Geo. S. Weaver	Albany, N. Y.	E. L. Marks.
Mar. 17,	125,000	Kenka	Yates	Geo. S. Weaver	Albany, N. Y.	E. L. Marks.
Mar. 17,	150,000	Lake George	Warren	R. L. Banks	Albany, N. Y.	E. F. Boehm.
Mar. 18,	162,000	Racket, Forked, South, Clear and Grampus	Hamilton	D. G. Helms	Long Lake, N. Y.	D. G. Helms and ors.
Mar. 21,	115,000	Lake George	Warren	R. L. Banks	Albany, N. Y.	E. L. Marks.
Mar. 22,	165,000	Skaneateles	Onondaga	T. V. Allis	New York	J. G. Roberts.
Mar. 23,	130,000	Lake George	Warren	R. L. Banks	Albany, N. Y.	E. F. Boehm.
Mar. 24,	150,000	Lake George	Warren	R. S. Coleman	Sandy Hill, N. Y.	E. L. Marks.
Total.	2,408,000					

DISTRIBUTION OF BROOK TROUT, CALEDONIA HATCHERY, 1887.

DATE.	No. of fish.	Waters.	County.	By whom ordered.	P. O. address.	By whom delivered.
Feb. 10.	30 000	Canadea Rush, Abbott, Alder Bottom, Hubbard, Thomson, Indian, Benjamin, Woods and Woodruff creeks	Allegany	P. E. Everett	Rushford, N. Y	J. G. Roberts.
Feb. 17,	20,000	Onondaga creek	Onondaga	T. U. Smith	South Onondaga	T. U. Smith.
Feb. 17,	10,000	White creek	Livingston	A. J. Tripp	Avon, N. Y.	A. J. Tripp.
Feb. 17,	18,000	Long pond	Lewis	R. J. Richardson	Lowville, N. Y.	J. G. Roberts.
Feb. 17,	2,000	Spring creek	Oneida	Wm. Woods	Walesville, N. Y.	J. G. Roberts.
Feb. 18,	12,000	Manlius, High Bridge and Todd's brook	Onondaga	Lewis Hueber	Fayetteville, N. Y.	Lewis Hueber.
Feb. 21,	25,000	Loon lake	Franklin	F. W. Chase	Loon Lake, N. Y.	F. Redband.
Feb. 21,	20,000	Sawmill, Peekskill and Canopis brooks	Westchester	B. R. Kittridge	New York	J. G. Roberts.
Feb. 22,	25,000	Amber lake, Jordan lake and Otter pond	St. Lawrence	J. Louis Webb	New York	Seaver Bowdish.
Feb. 23,	12,000	East Coy streams	Wyoming	C. D. Farman	Hermitage, N. Y.	C. D. Farman.
Feb. 24,	15,000	Pine creek	Allegany	H. D. Balcom	Canadea, N. Y.	H. D. Balcom.
Feb. 24,	30,000	East branch of West Canada creek and tributaries	Oneida	Dr. C. M. Hitchcock	Utica, N. Y.	Dr. C. M. Hitchcock.
Feb. 24,	12,000	Read brook	Oneida	F. Bristol	Remsen, N. Y.	Dr. C. M. Hitchcock.
Feb. 24,	12,000	Beaver Meadow and Baker brooks	Oneida	O. S. Evans	Remsen, N. Y.	Dr. C. M. Hitchcock.
Feb. 28,	4,000	Dry and Spider brooks	Monroe	O. S. Babcock	Churchville, N. Y.	F. D. Palmer.
Feb. 28,	15,000	Woodhull lake	Herkimer	Hon. J. K. Brown	Albany, N. Y	J. G. Roberts.
Feb. 28,	30,000	North and South branches Alder creek, Dory, Ritter and Shot brooks	Oneida	Hon. J. D. Kernan	Alder Creek, N. Y.	J. G. Roberts.
Mar. 2,	30,000	Crums creek and tributaries of First Sprite, Second Sprite and Little Sprite	Herkimer	W. H. Bacon	Dolgeville, N. Y.	M. A. Green.
Mar. 2,	30,000	Tributaries to West branch of East Canada creek	Herkimer	H. A. Dolge	Dolgeville, N. Y.	M. A. Green.
Mar. 2,	20,000	Pool's brook	Onondaga	J. G. Case	Kirkville, N. Y	M. A. Green.
Mar. 2,	20,000	Onondaga creek and tributaries	Onondaga	Henry Loftie	Syracuse, N. Y.	M. A. Green.
Mar. 2,	15,000	West branch of Unadilla river	Oneida	F. A. Holmes	Babcock Hill, N. Y.	F. A. Holmes.
Mar. 8,	25,000	Crooked, Cold and Dyton brooks	Chautauqua	A. E. Phillips	Sinclairville, N. Y.	J. Mason.
Mar. 11,	15,000	Daggett brook	Wyoming	Geo. Wright	Pike, N. Y.	M. A. Green.
Mar. 11,	15,000	Joiner and Flint brooks	Wyoming	A. J. Beebe	Pike, N. Y.	M. A. Green.
Mar. 11,	15,000	Dennis and Merville brooks	Wyoming	E. N. Emery	Pike, N. Y.	M. A. Green.
Mar. 14,	30,000	Cork Centre, Empie Veghte, Lottridge, Van Auken, Case, Marple, Druey, Peak, Plank and Gage brooks	Fulton	Geo. Yost	Johnstown, N. Y.	F. Redband.
Mar. 14,	30,000	Lasher, Maloney, McVane, Cold Springs, Blanchard, Warren, Lefler, Bennett's Corners, Parsons, Shutts, Easterly, Swamp Jim, Jackson Summit, Black Snake, Tripole, Stoney, Alder Meadow, Holer, Robinson and Wright brooks	Fulton	Z. B. Whitney	Gloversville, N. Y.	F. Redband.

Mar. 15,	30,000	Roosman, Link, Harlemville, Crayville, Groote, New Sydam and Ecclestyns brooks	Columbia	H. A. Feroe	Hudson, N. Y.	J. G. Roberts.
Mar. 18,	25,000	Rocket lake, Forked lake, South pond, Clear pond and Grampers lake	Hamilton	D. G. Helms	Long Lake, N. Y.	D. G. Helms & others
Mar. 21,	15,000	West branch Chenango river and tributaries	Madison	J. W. Clark	Hamilton, N. Y.	E. F. Boehm.
Mar. 21,	30,000	Oriskany creek, Tinna, Baker and Bromley brooks	Oneida	H. O. Hicks	Oriskany Falls, N. Y.	E. F. Boehm.
Mar. 22,	10,000	Nauvoo and St. John brooks W. tributaries to Neversink river	Sullivan	N. T. Hodge	Neversink, N. Y.	M. Shaffer.
Mar. 22,	15,000	Little Beaverkill and branches	Sullivan	Edward Kearney	Neversink, N. Y.	E. Kearney.
Mar. 23,	3,000	North west brook	Warren	T. F. H. Meyer	New York, N. Y.	E. F. Boehm.
Mar. 25,	10,000	Beaverkill creek	Del. & Sul'v'n	M. R. Dodge	Rockland, N. Y.	M. R. Dodge.
Mar. 25,	7,000	Willowemoc river	Sullivan	W. E. Sprague	Roscoe, N. Y.	J. Campbell.
Mar. 29,	14,000	Manor lake	Columbia	F. S. DeLamater	Hudson, N. Y.	F. S. DeLamater.
Mar. 30,	18,000	Bennett, Bradley, Toby, Griswold and Baker creek	Delaware	J. E. Barnaby	Masonville, N. Y.	W. A. Priest and H. R. Bennett.
Mar. 30,	12,000	Larnce, Travis, Vellie	Sullivan	F. Dean	Neversink, N. Y.	F. Dean.
Mar. 30,	12,000	Afill, Shumway and Benson creeks	Sullivan	Henry W. Dean	Neversink, N. Y.	H. W. Dean.
Mar. 30,	12,000	Chestnut, Popastone and Birds creeks	Sullivan	N. J. Benson	Neversink, N. Y.	Ira Martin.
Mar. 30,	25,000	Shinglekill, Kiskatone creeks and tributaries	Greene	Josephine Hopkins	Catskill, N. Y.	F. Redband.
Mar. 31,	65,000	Cadosia and Carr's creek, East, West Third, Marvin, Baxters, Trout, Appleys, Derbies, Stuvants, Buck, Eddy, Cold Spring, Martin Hill, Barry, State Road, Russell, Tylers and East brooks	Delaware	E. Canfield	Middletown, N. Y.	E. F. Boehm.
April 4,	28,000	Willowemoc river and tributaries	Sullivan	J. G. Stevens	Liv'g't'n Manor, N.Y.	E. B. Hodge.
April 4,	21,000	Shin creek and Beaverkill creek and tributaries	Sullivan	E. R. Sprague	Shin Creek, N. Y.	E. R. Sprague.
April 6,	19,000	White creek, Black creek and Perkins Hollow brook	Washington	C. W. Whitcomb	Salem, N. Y.	J. C. McNaughton.
April 11,	18,000	Fly brook and Dundee brook and tributaries	Otsego	N. A. Marcy	Burli'gt'n Flats, N.Y.	E. L. Talbot.
April 12,	12,000	Lake Titus and Beaver pond	Franklin	C. M. Amsden	New York, N. Y.	C. M. Amsden.
April 12,	15,000	Middle Mongaup and tributaries	Sullivan	Charles Messiter	Liberty, N. Y.	E. R. Dusenbury.
April 12,	7,000	Benton Hollow streams	Sullivan	A. P. Buckley	Liberty, N. Y.	Edward Champlin.
April 13,	25,000	Tremperskill creek and tributaries	Delaware	J. Ballantine	Andes, N. Y	Wm. Gammel.
April 13,	30,000	Steels, Peaks, Platner, Fall Mill, Elk, Glenbury, Little Delaware and Bogley brooks	Delaware	F. H. Griffis	Delhi, N. Y.	E. L. Hilt.
April 13,	30,000	Spring streams in first assembly district	Orange	J. R. Sloat	Newburgh, N. Y.	F. Redband.
April 14,	2,000	Spring creek	Genesee	C. G. Buell	Batavia, N. Y.	C. G. Buell.
April 14,	25,000	Stevens brook and tributaries	Sullivan	W. C. Kinne	White Lake, N. Y.	W. C. Kinne.
April 15,	12,000	Ten Mile brook	Albany	F. C. Huyck	Albany, N. Y.	J. Mason.
April 16,	5,000	North branch Callicoon creek	Sullivan	J. B. Anderson	Callicoon Depot, N.Y.	F. Sutleiff.
April 19,	5,000	Oswegatchie river	Lewis	P. J. Corcoran	Bedford, N. Y.	C. F. Neibergall.
April 19,	10,000	Crystal brook and tributaries	Lewis	C. F. Neibergall	Garden Corn'rs, N.Y.	C. F. Neibergall.
April 21,	15,000	Shunpike, Deep Hollow, Shekomoko and Amenia brooks	Dutchess	Wm. H. Bartlett	Amenia, N. Y.	M. A. Green.
April 28,	15,000	Cemetery, Cold, Sandy and Felts Mill creek and tributaries	Jefferson	J. Q. Adams	Watertown, N. Y.	E. L. Marks.
May 3,	18,000	Campbell, Twelve Mile, Neils and Spring creeks	Steuben	A. M. Davis	Cohocton, N. Y.	E. F. Boehm.
May 3,	12,000	Stocking run, Spaulding and Cold Spring cr'ks	Steuben	Z. L. Parker	Bath, N. Y.	E. F. Boehm.

DISTRIBUTION OF BROOK TROUT IN 1887— *(Continued).*

DATE.	No. of fish.	Waters.	County.	By whom ordered.	P. O. address.	By whom delivered.
May 14,	18,000	Callicoon creek and tributaries	Sullivan	C. A. Thornelle	Callicoon Depot, N.Y.	C. A. Thornelle.
May 17,	12,000	Owego creek and tributaries	Sullivan	B. M. Stebbins	Owego, N. Y.	E. L. Marks.
May 17,	2,000	Allen creek	Monroe	Frank Little	Rochester, N. Y.	Frank Little.
May 25,	5,000	Spring creek and tributaries	Livingston	Seth Green	Rochester, N. Y.	F. Redband.
May 28,	5,000	Caledonia creek	Livingston	Seth Green	Rochester, N. Y.	E. F. Boehm.
June 4,	2,000	Caledonia creek	Livingston	Seth Green	Rochester, N. Y.	E. F. Boehm.
Total..	1,208,000					

DISTRIBUTION OF WHITE-FISH FROM CALEDONIA HATCHERY IN 1887.

Feb. 9,	140,000	Lake Ontario	Monroe	Seth Green	Rochester, N. Y.	J. Mason.
Feb. 12,	160,000	Lake Ontario	Monroe	Seth Green	Rochester, N. Y.	J. Mason.
Feb. 14,	65,000	Rye lake	Westchester.	A. L. Squire	White Plains, N. Y.	Frank Redband.
Feb. 17,	300,000	Lake Ontario and Niagara river	Niagara	Hon. David Miller	Lockport, N. Y.	J. Mason.
Feb. 21,	50,000	Hemlock lake	Livingston	W. H. Pierce	Springwater, N. Y.	J. Mason.
Feb. 24,	60,000	Owasco lake	Cayuga	J. A. Clary	Auburn, N. Y.	J. G. Roberts.
Mar. 3,	122,000	Lake Ontario	Niagara	Hon. David Miller	Lockport, N. Y.	J. Mason.
Total..	897,000					

DISTRIBUTION OF BROWN OR GERMAN TROUT FROM CALEDONIA HATCHERY, 1887.

Mar. 14,	7,000	Peck, Plank and Gage brooks	Fulton	Geo. Yost	Johnstown, N. Y.	F. Redband.
Mar. 14,	7,000	Holer, Robinson and Wright's brooks	Fulton	Z. B. Whitney	Gloversville, N. Y.	F. Redband.
Mar. 15,	7,000	Sydam and Eccletyns brooks	Columbia	H. A. Feroe	Hudson, N. Y.	J. G. Roberts.
Mar. 18,	15,000	South and Clear ponds	Hamilton	D. G. Helms	Long Lake, N. Y.	D. G. Helms & o'rs.
Mar. 22,	10,000	Hodge and Conklin brooks	Sullivan	N. T. Hodge	Neversink, N. Y.	M. Shaffer.
Mar. 25,	10,000	Beaverkill	Del. & Sul'v'n	M. R. Dodge	Rockland, N. Y.	M. R. Dodge.
Mar. 25,	10,000	Willowemoc river	Sullivan	W. E. Sprague	Roscoe, N. Y.	J. Campbell.
Mar. 29,	7,000	Beyust, Willis and Hyzer river	Delaware	J. E. Barnaby	Masonville, N. Y.	W. A. Priest and H. R. Bennett.
Mar. 30,	6,000	Wild Meddon brooks, tributaries to Neversink river	Sullivan	F. Dean	Neversink, N. Y.	F. Dean.
Mar. 30,	6,000	Broom and Sharp creeks	Sullivan	H. W. Dean	Neversink, N. Y.	H. W. Dean.
Mar. 30,	6,000	Wolf and Hansen brooks	Sullivan	N. J. Benson	Neversink, N. Y.	Ira Martin.
Mar. 30,	6,000	Shingle Kill and Kiskatone creeks	Greene	Josephine Hopkins,	Catskill, N. Y.	F. Redband.
Mar. 31,	10,000	Rood, Russell's, Tyler's and East brooks	Delaware	E. Canfield	Middletown, N. Y.	E. F. Boehm.
April 4,	14,000	Willowemoc creek and tributaries	Sullivan	J. G. Stevens	Liv'g'n Manor, N. Y.	E. B. Hodge.
April 4,	7,000	Shin creek and Beaver Kill	Sullivan	E. R. Sprague	Shin Creek, N. Y.	E. R. Sprague.

April 6,	6,000	Hollow, Beaver and Waford's brooks	Washington	C. W. Whitcomb	Salem, N. Y.	J. C. McNaughton.
April 11,	3,000	Fly and Dundee brooks	Otsego	N. A. Marcy	Burling'n Flats, N.Y.	E. L. Talbot.
April 13.	20,000	Steele's, Peaks, Platner, Fall Mill, Elk, Glenbury, Little Delaware and Bagley brooks	Delaware	F. H. Griffis	Delhi, N. Y.	E. L. Hitt.
April 14,	2.000	Spring creek	Genesee	C. G. Buell.	Batavia, N. Y.	C. G. Buell.
April 19,	5,000	Oswegatchie river	Lewis	P. J. Corcoran	Belford, N. Y.	C. F. Neibergall.
April 19,	10,000	Crystal brook and tributaries	Lewis	C. F. Neibergall	Garden Corn's, N. Y.	C. F. Neibergall.
April 21,	15,000	Shumpike, Deep Hollow, Shekomoko and Amenia brooks	Dutchess	W. H. Bartlett	Amenia, N. Y.	M. A. Green.
April 28,	21,000	Oatka creek and tributaries	Mon. & Gen.	A. F. McPherson	Mumford, N. Y.	A. F. McPherson.
April 28,	15,000	Cemetery, Cold, Sandy, Felts Mill creek and tributaries	Jefferson	J. Q. Adams	Watertown, N. Y.	E. L. Marks.
May 3,	18,000	Campbell, Twelve Mile, Neil's and Spring creeks	Steuben	A. M. Davis	Cohocton, N. Y.	E. F. Boehm.
May 3,	6,000	Cohocton river, Goff's and Neil's creek and tributaries	Steuben	W. W. Lindsay	Bath, N. Y.	E. F. Boehm.
May 4,	6,000	Tributaries to Canandaigua outlet	Ontario	H. Peck, O. J. Whitney	Phelps, N. Y.	F. Redband.
May 6,	20,000	Spring creeks and tributaries	Livingston	Seth Green	Rochester, N. Y.	E. L. Marks.
May 10,	12,000	Mead's Creek and Dry Run	Steuben	J. H. Way	Corning, N. Y.	J. Mason.
May 12,	20,000	Neil's creek and tributaries	Steuben	E. C. Grover	Wallace, N. Y.	J. Mason.
Total..	307,000					

DISTRIBUTION OF CALIFORNIA TROUT FROM CALEDONIA HATCHERY IN 1887.

May 3,	18,000	Cohocton river, Goffs creek, Neils creek and tributaries	Steuben	W. W. Lindsay	Bath, N. Y.	E. F. Boehm.
May 4,	50,000	Loon lake	Franklin	F. M. Chase	Loon Lake, N. Y.	F. Redband.
May 4,	25,000	Tributaries to Canandaigua outlet	Ontario	Hiram Peck and O. J. Whitney	Phelps, N. Y.	J. Mason.
May 10,	25,000	Chemung river	Steuben	J. H. Way	Corning, N. Y.	J. Mason.
May 12,	25,000	Neils creek and tributaries	Steuben	E. C. Grover	Wallace, N. Y	J. Mason.
May 14,	30,000	Callicoon creek and tributaries	Sullivan	C. A. Thornelle	Callicoon Depot, N.Y.	C. A. Thornelle.
May 17,	30,000	Owego creek and tributaries	Tioga	B. M. Stebbin	Owego, N. Y.	E. L. Marks.
May 23,	42,000	Rye lake	Westchester	A. L. Squire	White Plains, N. Y.	E. F. Boehm.
May 26,	36,000	Mohawk river	Montgomery	Hon. E. Wemple	Fultonville, N. Y.	E. L. Marks.
May 26,	18,000	Lasher and Lothage creeks	Fulton	Z. B. Whitney	Gloversville, N. Y.	E. L. Marks.
May 26,	24,000	Onondaga creek and tributaries	Onondaga	Henry Loftie	Syracuse, N. Y.	E. L. Marks.
May 26,	6,000	Manlius, High Bridge and Todds brooks	Onondaga	Lewis Heuber	Fayetteville, N. Y.	E. L. Marks.
June 2,	40,000	Western tributaries to Neversink river	Sullivan	L. L. Waldorf	Woodburn, N. Y.	L. L. Waldorf.
June 2,	40,000	Eastern tributaries to Neversink river	Sullivan	John Todd	Woodburn, N. Y.	John Todd.
June 3,	100,000	Seneca lake	Ontario	H. L. DeZeny	Geneva, N. Y.	E. L. Marks.
June 9,	42,000	Trout lake	Washington	Hon. Jos. Potter	Whitehall, N. Y.	E. F. Boehm.
June 9,	110,000	Seneca lake	Schuyler	Major J. P. Kimball	West Point, N. Y.	E. L. Marks.
June 13,	45,000	Tributaries to Canandaigua inlet	Wayne	Henry Killick	Lyons, N. Y.	M. A. Green.
June 17,	40,000	Neversink river and tributaries	Sullivan	Ira Martin	Woodburn, N. Y.	Ira Martin.
June 20,	35,000	Tributaries to Cayuga lake inlet	Cayuga	H. Greenfield	Moravia, N. Y.	B. Shaddock.
June 20,	12,000	Bradley brook	Orange	E. Canfield	Middletown, N. Y.	E. L. Marks.

DISTRIBUTION OF CALIFORNIA TROUT IN 1887 — *(Concluded).*

DATE.	No. of fish.	Waters.	County.	By whom ordered.	P. O. address.	By whom delivered.
June 21,	10,000	Spring creek	Putnam	J. M. Toucey	New York, N. Y.	Eli Weed.
June 23,	40,000	Tributaries to Lake George	Warren	R. S. Coleman	Sandy Hill, N. Y.	E. L. Marks.
June 23,	12,000	Spring creek	Ulster	Hon. W. Davis	Kingston, N. Y.	J. Mason.
June 28,	80,000	Seneca lake	Ontario	H. L. DeZeny	Geneva, N. Y	E. L. Marks.
July 1,	11,000	Honeoye creek	Ontario	P. F. Lynch	W. Bloomfield, N. Y.	B. Shoddock.
Total..	946,000					

ACCOUNT OF SPAWN SHIPPED FROM CALEDONIA HATCHERY, 1886–87.

1886.

Nov. 5. Wm. G. Stimson, Morehouseville, Hamilton county, N. Y.: 100,000 salmon-trout spawn, 20,000 brook trout spawn; salmon-trout for Big Rock and Pine lakes, Hamilton county; brook trout for Wilmurt creeks, Hamilton county.

Dec. 10. Indian Hollow brook trout fishery, Windham, Conn., Richard E. Follett, proprietor: 5,000 salmon-trout spawn, in exchange for 5,000 brook trout spawn.

Dec. 13. Ragged Lake fish hatchery, Franklin county, N. Y.: 100,000 salmon-trout spawn, 50,000 brook trout spawn, 65,000 German trout spawn; for Ragged lake and Spring creeks in Franklin county; ordered by Hon. James Geddes, vice-president Ragged Lake Rod and Gun Club, Syracuse, N. Y.; delivered by J. G. Roberts.

Dec. 20. Fulton Chain hatchery, Herkimer county, N. Y.: 450,000 salmon-trout spawn, 60,000 brook trout spawn, 50,000 German trout spawn; delivered, hatched and distributed by E. F. Boehm, superintendent; sent by order of Board of Fish Commissioners, State of New York.

Dec. 23. New York State Adirondack fish hatchery, Essex county, N. Y.: 400,000 salmon-trout spawn, 10,000 German trout spawn, 103,000 white-fish spawn; ordered by Hon. R. U. Sherman, Commissioner of Fisheries, New Hartford, Oneida county, N. Y.; delivered by Frank Redband.

1887.

Jan. 26. P. A. M. Van Wyck, New Hamburgh, Dutchess county, N Y.: 5,000 German trout spawn, 5,000 brook trout spawn; shipped to J. G. Burrows, Fishkill village, N. Y., for streams in Dutchess county.

Feb. 9. Philo Dunning, Madison, Wis.: 2,000 brown or German trout spawn, for Wisconsin fish hatchery; sent by order William H. Bowman, Commissioner of Fisheries, State of New York.

Feb. 17. Bisby Lake hatchery, Herkimer county: 10,000 brown or German trout eggs; ordered by Hon. R. U. Sherman, New Hartford, Oneida county, N. Y.

Feb. 21. Cold Spring hatchery, Cold Spring Harbor, Suffolk county, N. Y.: 90,000 brook trout spawn, 10,000 rainbow trout spawn; sent by order of Board of Fish Commissioners, State of New York.

1887.

Feb. 21. E. G. Blackford, Fulton market, New York: 10,000 rainbow trout spawn, to be exchanged for blue-backed trout spawn; 10,000 rainbow trout spawn, to be exchanged for European trout spawn.

March 28. E. G. Blackford, Fulton market, New York: 10,000 California trout spawn, for exchange.

April 27. St. Lawrence fish hatchery, Jefferson county, N. Y.: 160,000 California trout spawn; ordered and delivered by M. B. Hill, superintendent.

April 29. James Annin, Caledonia, Livingston county, N. Y.: 25,000 California trout spawn; in exchange for 25,000 brook trout eggs.

May 4. Schroon Lake hatchery, Warren county, N. Y.: 161,000 California trout spawn; ordered by C. F. Taylor, South Schroon P. O., Essex county, N. Y.; delivered by C. E. Benedict, superintendent, Pottersville, Warren county, N. Y.

May 10. R. E. Follett, Windham, Conn.: 50,000 California trout spawn; in exchange for 60,000 brook trout spawn.

Total number of salmon-trout spawn	1,055,000
Total number of brook trout spawn	225,000
Total number of German trout spawn	142,000
Total number of white-fish spawn	103,000
Total number of rainbow trout spawn	436,000
Grand total	1,961,000

DISTRIBUTION OF ADULT FISH FROM WESTERN WIDE WATERS, ROCHESTER, N. Y., 1887.

DATE.	Numbers and names of fish.	Waters.	County.	By whom ordered.	P. O. address.	By whom delivered.
April 11,	40 black bass	Toucey lake	Putnam	J. M. Toucey	Garrisons, N. Y	Eli Weed.
April 13,	40 black bass, 60 rock bass, 100 bullheads	Silver lake	Wyoming	R. Surdam	Silver Springs, N. Y.	R. Surdam.
April 13,	40 black bass, 60 rock bass	Highland lake	Rockland	Col. E. W. Bass	West Point, N. Y.	F. Redband.
		Vought lake	Orange			
April 13,	15 Oswego bass, 10 wall-eyed pike		Orange	J. L. Sloat	Newburgh, N. Y.	F. Redband.
April 14,	40 black bass	Hoosic river, Tomhannock river and Schaghticoke creek	Rensselaer	F. Harwood	Schaghticoke, N. Y.	F. Harwood.
April 14,	40 black bass	Lake Superior and Pleasant pond	Sullivan	W. C. Kinne	White Lake, N. Y	W. C. Kinney.
April 14,	40 black bass, 15 Oswego bass	Hazard pond and Mt. Basha lake	Orange	G. A. Lamoreaux	Highland Mills, N.Y.	E. L. Marks.
April 15,	40 black bass, 60 rock bass	Lake Cuba	Allegany	H. L. Van Auken	Cuba, N. Y.	H. L. Van Auken.
April 15,	40 black bass	Small lake	Albany	F. C. Huyck	Konwood Mills, N.Y.	J. Mason.
April 15,	40 black bass	Arbutus lake	Staten Island	F. Saib	New York	J. Mason.
April 15,	40 black bass	Forest lake and Island pond	Orange	C. M. Nichols	Greenwood, N. Y.	F. Redband.
April 16,	42 black bass	Long pond	Sullivan	J. F. Anderson	Callicoon Depot, N.Y.	F. Sutleiff.

Total black bass	442
Total Oswego bass	30
Total rock bass	180
Total bullheads	100
Total wall-eyed pike	10
Grand total	762

Account of Shad hatching in Hudson river, at Catskill, N. Y.; temperature of water taken at 6 a. m. and 6 p. m.; fish caught at John Pindar's fishery near Catskill Landing; operations conducted by Jonathan Mason, under direction of Seth Green, Superintendent —1887.

DATE.	No. of shad caught.	No. spawn taken.	No. fry deposited.	Temperature, water.
May 19	40 shad	75,000	.....	68 and 70
May 20	25 shad	50,000	.....	68 and 70
May 21	Did not fish	.....	.....	69 and 71
May 22	Did not fish	.....	.....	70 and 73
May 23	30 shad	90,000	63,000	70 and 72
May 24	35 shad	225,000	40,000	72 and 73
May 25	85 shad	275,000	.....	72 and 73
May 26	45 shad	225,000	.....	72 and 74
May 27	40 shad	225,000	75,000	72 and 74
May 28	Did not fish	.....	205,000	71 and 73
May 29	Did not fish	.....	234,000	71 and 72
May 30	50 shad	200,000	195,000	70 and 70
May 31	40 shad	225,000	115,000	69 and 69
June 1	85 shad	280,000	.....	69 and 69
June 2	45 shad	210,000	.....	67 and 67
June 3	60 shad	175,000	.....	67 and 70
June 4	Did not fish	.....	170,000	67 and 69
June 5	Did not fish	.....	202,000	67 and 69
June 6	243 shad	750,000	238,000	67 and 69
June 7	165 shad	468,000	170,000	68 and 71
June 8	95 shad	320,000	148,000	68 and 71
June 9	60 shad	100,000	.....	68 and 71
June 10	45 shad	150,000	675,000	69 end 72
June 11	Did not fish	.....	421,000	70 and 73
June 12	Did not fish	.....	280,000	72 and 74
June 13	45 shad	224,000	85,000	73 and 75
June 14	35 shad	190,000	135,000	73 and 75
June 17	.....	.....	200,000	.....
June 18	.....	.....	171,000	.....
Totals	1,268 shad	4,457,000	3,822,000	.....

MISCELLANEOUS DISTRIBUTION OF FISH FROM CALEDONIA HATCHERY IN 1886–87.

1886.

Nov. 10. L. Heidell, 28 North Fitzhugh street, Rochester, N. Y.: one german trout, three California trout, one hybrid and four brook trout, all three years old; for aquarium.

Dec. 8. Oatka creek, Monroe county: 1,040 hybrids three-fourths brook and one-fourth salmon-trout (from four to five years old); delivered by W. D. Oviatt.

Dec. 9. A. M. Marsh, P. O. box 386, Buffalo, M. Y.: nine brook and California trout, three years old; for aquarium.

Dec. 10. Oatka creek, Monroe county: 562 hybrids three-fourth brook and one-fourth salmon-trout (from three to six years old); delivered by J. G. Roberts.

Dec. 10. Long pond, Livingston county: 520 California trout (from three to six years old); delivered by W. D. Oviatt and B. Shaddock.

1886.

Dec. 17. Long pond, Livingston county: 250 California trout (from three to six years old); delivered by J. Mason.

1887.

Jan. 27. Oatka creek, Monroe county: 100 hybrids, three-fourth brook and one-fourth salmon-trout (from four to six years old); delivered by M. A. Green.

March 10. H. L. De Zeng, Geneva, N. Y.: four brook trout, four brown trout, four California trout, all four years old, for aquarium.

April 20. Clifton pond, Ontario county, eight brook trout, two California trout, two salmon-trout, from two to three years old; ordered by N. P. Tiffany, Clifton Springs, N. Y.

June 3. Roosevelt ponds, Suffolk county, N. Y.: sixty German carp, from two to three years old; ordered by Hon. R. B. Roosevelt, 17 Nassau street, New York, delivered by Jonathan Mason.

FULTON CHAIN FISH HATCHERY, 1887.

Report of Edward F. Boehm, Superintendent.

Distribution of Salmon-Trout.

Feb. 3.	North branch of Moose river, First lake	20,000
	Delivered by C. J. Goodzell and S. Dunakin.	
Feb. 3.	Tributary to Third lake, Fulton chain, Herkimer county	35,000
Feb. 4.	Moss lake, Hamilton county	20,000
	Delivered by C. J. Goodzell and L. Wood.	
Feb. 4.	Fourth lake, Herkimer county	30,000
	Delivered by S. Dunakin and J. Van Aukenburg.	
Feb. 5.	Big Moose lake, Hamilton and Herkimer counties	35,000
	Delivered by C. J. Goodzell and L. Wood.	
Feb. 5.	Seventh lake, Fulton chain, Hamilton county	40,000
	Delivered by Fred. Hess and Arthur Shirts.	
Feb. 5.	Eagle lake, Hamilton county	5,000
Feb. 5.	Second lake, North branch Moose river	25,000
	Delivered by C. J. Goodzell.	
Feb. 8.	Lime lake, Herkimer county	40,000
	Delivered by C. J. Goodzell.	
Feb. 9.	Second lake, Fulton chain	12,000
	First lake, Fulton chain	12,000
	Delivered by E. F. Boehm and C. J. Goodzell.	

Feb. 9.	Head of Fourth lake, Fulton chain	20,000
	Delivered by L. Wood.	
Feb. 9.	North branch pond	5,000
	Delivered by S. Dunakin.	
Feb. 9.	Nicks lake, Herkimer county	10,000
	Delivered by C. J. Goodzell.	
Feb. 9.	Little Moose lake, Herkimer county	30,000
	Delivered by John Van Valkenburg.	
Feb. 10.	Fourth lake, Fulton chain	25,000
	Delivered by Will Sherry.	
Feb. 11.	Fourth lake, Fulton chain	30,000
	First lake, Fulton chain	30,000
	Delivered by C. J. Goodzell and E. F. Boehm.	
	Total number of salmon-trout distributed	424,000

DISTRIBUTION OF SPECKLED AND BROWN OR GERMAN TROUT.

Feb. 5.	Tributaries to Seventh lake, Hamilton county: Speckled trout	10,000
	Delivered by Arthur Shirts.	
Feb. 5.	Tributaries to north branch Moose river: Speckled trout	10,000
	Delivered by William Lord.	
Feb. 8.	Bluff and Windfall ponds, Hamilton county: Speckled trout	10,000
	Delivered by James Higby.	
Feb. 9.	Wood creek tributary to Fourth lake: Speckled trout	2,000
	German trout	2,000
	Delivered by T. Wood.	
Feb. 9.	Dunakin pond, Herkimer county: Speckled trout	5,000
	German trout	2,000
	Delivered by S. Dunakin.	
Feb. 9.	Nicks lake, Herkimer county: Speckled trout	15,000
	Delivered by C. J. Goodzell.	
Feb. 9.	Little Moose lake, Herkimer county: speckled trout	7,000
	Delivered by J. Van Valkenburg.	
Feb. 10	West pond: speckled trout	2,000
	German trout	3,000
	Delivered by S. Dunakin.	

Feb. 10.	Panther lake : speckled trout	3,000
	German trout	4,000
	Delivered by Frank Johnson.	
Feb. 10.	Headwaters Fourth lake : speckled trout	7,000
	Delivered by Will Sherry.	
Feb. 11.	Headwaters Moose river, Herkimer county : German trout	25,000
Feb. 12.	Tributaries Moose river near Forge house : German trout	10,000
	Delivered by E. F. Boehn and C. Goodzell.	
	Total speckled trout distributed	71,000
	Total German trout distributed	46,000

COLD SPRING HARBOR.

REPORT OF FRED MATHER,

SUPERINTENDENT.

REPORT OF FRED MATHER, SUPERINTENDENT.

To the Commissioners of Fisheries of New York:

GENTLEMEN. — I have the honor to make the following report of operations at this station during the past year:

The number of fish of different kinds hatched and planted amounted to over nine and a half millions, an increase over last year of above three millions. A large proportion of these were popular food fishes, such as shad, white-fish, smelts and tomcods.

The United States Fish Commission coöperated with us, as in former years, and we hatched salmon and shad eggs furnished by Commissioner Baird which were planted within this State, and the expenses of freight, hatching and distribution were borne by the general government, which also paid the wages of our two experts, as follows: C. H. Walters: November, 1886; January, February, March, April, May and November, 1887. O. V. Rogers: November and December, 1886; January, February, March, April, May and November, 1887. In addition to this the State was given many eggs of foreign trout.

Although fish culture has lost in Prof. Spencer F. Baird, the late Commissioner of Fisheries of the United States who died in August last, one of its greatest friends and supporters, and one who has done much to advance the work in all the States and territories, we have every reason to believe that his successor, Prof. G. Brown Goode, will continue to assist in the work in New York as well as in other States.

The ponds have had sod laid along them and mussel-shell walks made, the shells being those from which the meat was extracted for fish food, and they make a neat and dry walk. Much grading has been done on the low land and more ponds are needed to contain the fry raised this year. A handsome octagon engine-house has been built out of the material of the old one which was a lean-to on the old hatchery which is to be torn down. This building, which will serve both for the salt-water pump and for cooking fish food, needed only new siding and shingles, and was built by our own men, costing less than fifty dollars.

THE NEW HATCHERY.

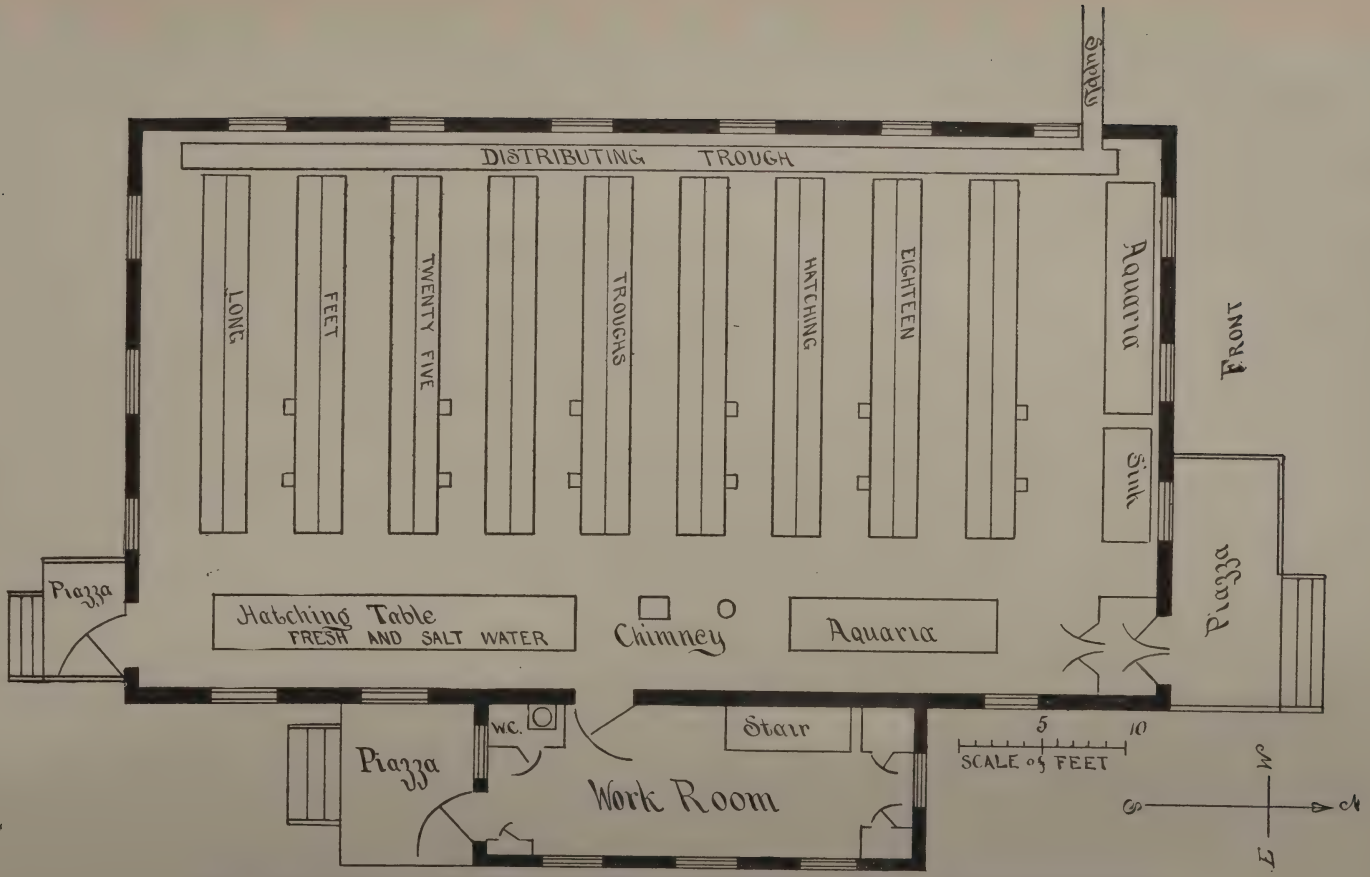
The new building was delayed through the absence of the owner of the land and his attorney, until October. The contract was then given to the lowest bidder and work was begun in November. The terms require it to be finished by January 1, 1888, and no doubt it will be completed by that time. In the meantime we will use the old brick building for trout eggs; the salmon, white-fish, smelt, etc., do not come until later. The hatching-room will be sixty-five by thirty-six feet, eleven feet high and will be finished in yellow pine throughout, the frame being of that material also. On the east side there will be a workshop ten by twenty-nine feet, and above the hatchery a dwelling for one of the men. The architectural work, together with the specifications, was done by a practical mechanic after my own plans. Nothing is wasted in ornament, but all is plain, practical and economical, and at the same time is shapely and not barn-like. A plan of the main floor and also the front (north) elevation is given, but as the building is not completed a perspective view cannot conveniently be made. I feel confident in saying that after having seen the principal hatcheries in Europe and America, and being familiar with all late improvements in apparatus for fish culture, that this new hatchery will bear comparison with any for arrangement, convenience and efficiency. Heretofore we have had thirty-two hatching troughs with a capacity of 30,000 trout, or 50,000 salmon each, besides our "McDonald" hatching jars for white-fish and shad and our salt-water hatcheries. The new building will give us thirty-eight troughs, which, worked on the "Williamson" arrangement, will multiply these figures by five. Last winter we made one trough in this style for experiment, and although the invention is not a new one and has not been used in this State, to my knowledge, it worked well. In this trough the water flows up through four or more trays containing eggs and then over a partition and down under a second layer of trays, and the fry are confined between the trays until ready to plant. The inventor was a Californian and the Germans know the system as the "deep California troughs."*

It increases the capacity of an ordinary trough several times, and, while familiar with the theory for years, I confess to skepticism about it until I saw it in actual operation at the United States Station at Northville, Mich., under the superintendence of Mr. Frank N. Clark. One season's trial has convinced me of the usefulness of this invention,

*This method is used by Count von dem Borne, of Bernenchen, Germany, and by Oberburgomeister Carl Schuster, of Freiburg, Baden, who speak highly or the *Tief Californische bruttrog.*

NEW HATCHERY AT COLD SPRING HARBOR. FRONT ELEVATION.

DESIGNED BY FRED MATHER.



NEW HATCHERY AT COLD SPRING HARBOR. PLAN OF HATCHING FLOOR.

DESIGNED BY FRED MATHER.

and several troughs have been fitted with it. In planning the dwelling rooms above the idea has been to make them convenient and comfortable for a family. It is possible that some future superintendent may use it as a dwelling, as the house I now occupy is not owned by the State.

Before the work was begun the appended advertisement was inserted in the following local papers: *The Long Islander* and *The Suffolk Bulletin*, of Huntington; *The South Side Signal*, of Babylon, and *The Oyster Bay Pilot:*

Proposals Wanted.

FULTON MARKET, NEW YORK, *August* 3, 1887.

Sealed proposals will be received at the office of the superintendent, in Cold Spring Harbor, until Friday, August nineteenth, for the erection of a two-story frame hatchery building at that place; cost not to exceed $4,500. The plans and specifications can be seen at the office of Superintendent Fred. Mather, at Cold Spring Harbor. Should the commissioners be absent on an inspection of other hatcheries, the bids will not be opened until they return. Address all communications to the superintendent. The commissioners reserve the right to reject all bids.

E. G. BLACKFORD,
Commissioner of Fisheries.

In response to this four bids were made. The specifications called for bids for the erection of the building without finishing the second floor, but for the placing of all studding necessary, building the chimneys and laying the floor on that story, and separate bids were asked for completing the dwelling portion. Only one bid for finishing the upper portion was received. The bids were: Edward Holmes, $4,400; N. Ketcham, $4,300; McEwan & Co., $4,243; J. B. Lefferts, $3,830; all without upper floor. The contract was awarded to Mr. Lefferts, who also put in a bid for finishing the dwelling portion for $900; making $4,730 in all. At present writing, December 12, 1887, the frame is complete, the siding on, and the shingling in progress. As it will be desirable to have some one on the premises, it is proposed to complete the second story in the spring.

The *Forest and Stream* of November 3, 1887, said: "The hatchery at Caledonia has long been the principal source of supply of trout and white-fish, but the Long Island station is evidently going to be the leading one, as it has salt water facilities as well as a flow of fresh water. The *South Side Signal* says: 'The contract for building the new hatchery for the New York Fish Commission, at Cold Spring

Harbor, has been awarded to J. B. Lefferts, of Huntington. Work has been begun and the building is to be finished by January 1. It will be the finest hatchery in the State, and its capacity will be greatly increased. Superintendent Mather has designed some improvements in both the fresh and salt water departments which will materially simplify the work of hatching and bring it all together on one floor instead of on two as in the old house.'"

BROOK TROUT.

We took 28,000 eggs from our own limited number of fish, received 90,000 from the Caledonia station, and hatched 50,000 that Mr. F. T. Underhill purchased from private parties, making 168,000 in all. The loss in eggs and fry was 22,054, and 145,946 fry were planted, as per table. The fish kept from the hatch of 1886 are the largest yearlings I ever saw, and milt was taken from some of the males at seven months old, a circumstance which, if it has occurred before, has escaped either my memory or reading. They are now spawning.

BROWN TROUT.

Our brown trout in ponds were reduced in numbers by their habit of jumping out on the land when disturbed. Their spawing season was from November seventh to December fifteenth, the largest number of eggs from one two-year-old female being 1,500. We received several lots from Europe for the United States Fish Commission and kept some. The Deutscher Fischerei-Verein, through its president, Herr von Behr, sent 60,000 eggs, of which 14,000 were dead on receipt, although the last lot of 10,000 only contained 1,514 dead, and Herr Max von dem Borne, of Bernenshen, sent 78,000 eggs, of which 46,000 were dead on arrival, one shipment of 50,000 being nearly all dead. We hatched a fair number of the surviving eggs and distributed over 39,000 fish. The North German Lloyd Steamship Company brought these eggs free of charge. Concerning this European trout I will quote the following from the Bulletin of the United States Fish Commission of 1887, page 21, written by me:

"In July, 1886, Mr. Amsden, a banker, of Rochester, N. Y., sent to Mr. E. G. Blackford, of Fulton market, a brown trout which weighed, on its receipt by Mr. Blackford, three pounds. It was taken in Allen's creek, Monroe county, New York, a tributary of the Genesee river, which receives the famous Caledonia creek, on which the hatchery of the New York Fish Commission at Mumford is placed. The fish must have been one which was hatched at the New York station in March, 1883, from eggs sent there by me. These eggs were the first which

were received in America, and came to me as a personal present from my friend, Mr. von Behr, president of the Deutscher Fischerei-Verein, whose headquarters are at Berlin, and consequently the fish was about three years and three months old.

"At the time that these eggs were sent from Germany, Mr. von Behr advised me that there were two kinds of them, not species, nor even varieties, but merely from different waters. One kind, the larger ones, were from trout inhabiting deep lakes, while the smaller kind were from the mountain streams. These kinds are probably analogous in respect of size to the *fontinalis* of the Rangeley lakes of Maine and those of our other eastern American waters, as near as I understand the case. I sent to the Caledonia station eggs of both kinds, and this fish, which was taken in Allen's creek, is probably one that escaped from the hatchery, unless a plant had been made in the creek.

"In the ponds now under my charge at Cold Spring Harbor, we reserved some of these first importations, but lost the greater portion of them from various causes. The station was then new and the waters were infested with eels, which have since been kept down as far as possible, and, while we raised several thousand to be a year old, we lost the most of these by their jumping from the pond they were confined in, an event which has been previously recorded in the publications of the Fish Commission. Of the few that were left there was one which was somewhat larger than its fellows, and proved to be a male fish, and was named 'Herr von Behr,' in honor of my German friend. In October, 1886, when it was three and a half years old, we took it from the pond and placed it in an aquarium in the hatchery, which had a good flow of running water, in order to show it to the New York Fish Commissioners, who were expected the next day. In the morning the fish was dead, and it now reposes in alcohol, where its size can be admired by visitors. Its weight was three and a half pounds plump, or at the rate of one pound a year.

"Mr. James Annin, Jr., proprietor of the trout ponds at Caledonia, N. Y., writes that the growth of the brown trout in his ponds is greater than that of the native brook trout.

"Mr. A. D. Frye, of Bellmore, Long Island, writes me, under date of March 27, 1887, as follows: 'Two years since I applied to you for some brown trout to stock a public stream, called Newbridge creek, at this place, and you furnished them. I have by inquiry learned that last summer some of these fish were taken which weighed three-quarters of a pound.'

"According to this, these fish could not have been more than one and a half years old; and from my experience I think that the brown

trout, as it is called in England, and which is the common brook trout of Europe (*Salmo fario*), is a quick-growing fish, which is destined to become a favorite in America when it is thoroughly known. I have taken this fish, in Europe, with a fly, and consider it one of the gamiest, in fact, *the* gamiest, trout that I ever handled with a rod. I will state, however, that angling friends who have had more extended experience in European fishing than I have, say that the Loch-Leven trout is a gamier and better fish than the brown trout, but I have had no experience with the Loch-Leven fish further than to hatch it. I believe that the brown trout will be found to be a better fish, taking it all around, than our own native *fontinalis*. The reasons for this belief are: (1) It is of quicker growth; (2) it is gamier; (3) except in the breeding season, when the males of *fontinalis* are brilliantly colored, it is fully as handsome; (4) from what I can learn I incline to think it will bear water several degrees warmer than *fontinalis*, and therefore it is adapted to a wider range.

"COLD SPRING HARBOR, N. Y., *April* 20, 1887."

LOCH-LEVEN TROUT.

This fish, mentioned in the last report (p. 43), is no doubt a mere local race of brown trout, which grow rapidly in the Scottish lake from which they take their name (*Salmo levenensis*), at least this is the opinion of James R. G. Maitland, Esq., proprietor of the celebrated fish-cultural establishment known as the Howietown fishery, near Stirling, where they are extensively bred.

On January fourteenth we received from Mr. Maitland three cases, containing 48,000 eggs in all. Of these there were 20,300 dead, leaving 27,700 apparently good eggs. They hatched well, and 21,500 fry were distributed, as per table. We have a fine lot of fry now, eight months old. We can not distinguish them from brown trout, and only know them by the ponds in which they were placed. Some individuals are larger than the brown trout and others are smaller, the growth being more uneven; the larger specimens being splendid fellows, fully six inches long. Mr. Maitland presented these to the commission, and we returned his packing cases, the Cunard Steamship Company carrying the cases both ways free of charge.

SALMON.

We received 300,000 eggs of the Penobscot salmon, in three lots, from the United States station at Orland, Me., in charge of Mr. Charles G. Atkins, only 537 being dead. They came on February third, twenty-third and twenty-fifth. They hatched well, and 242,150 were

planted within the State, and 50,000 in the Housatonic river, the general government defraying the entire expense. The number of captures of salmon in the Hudson river has increased, and shows that with proper fish ways and protecting laws it can be made a permanent and self-sustaining salmon river. On this subject *Forest and Stream* of April 14, 1887, said: "Among the curiosities of game bills this year is one in the New York Legislature relating to salmon. Unless a man reads the newspapers pretty carefully or studies the *Forest and Steam* he would not dream that New York was especially concerned with the protection of a fish which has been from time immemorial a stranger to its waters. The new legislation is very necessary, however, to provide for the Hudson river salmon put in by the United States Fish Commission. If the law is made and enforced, the salmon, it is hoped, may prove a substantial addition to the river resources of the State, just as the moose put in the north Woods would have been an addition to the forest resources if the law to protect them had protected. It is not so hard to secure these new species as it is to keep them after we once have them, and to guard them from immediate extermination at the hands of cupidity. If there were no statute to protect the Hudson salmon, the New York fishermen would serve them in just the way the Connecticut fishermen serve the salmon of that river."

Concerning protective laws the same journal in its issue of April 28, 1887, said: "We are informed that the young salmon planted by the United States Fish Commission in a stream about North Creek, Warren County, N. Y., have been captured by trout fishers. Our correspondent says: 'I was told recently that a number of salmon were caught from Balm of Gilead brook last year and were not put back in the water. We ought to have the six-inch trout law again, and I hope we will.' As these fish are not found in the brooks after they have grown to a length exceeding six or eight inches it is wrong to kill them. All right-minded anglers will at once return small salmon to the water if they are hooked while trout fishing. The people who live near the brooks which have been stocked by the Fish Commission at a considerable expense should interest themselves to protect those fish."

The following letter on the subject of salmon in the Hudson river, and of fish-ways for them was written to Dr. Samuel B. Ward, president of the Eastern New York Fish and Game Protective Association, in reply to a communication from him:

DEAR SIR. — I have yours of January twenty-four, suggesting that I might wish to say something regarding the salmon in the Hudson

river. I have, as you are probably aware, conducted the hatching and planting of the true sea salmon which have been placed in the river for the past five years, under the direction of Prof. S. F. Baird, United States Commissioner of Fish and Fisheries. The eggs were obtained from the United States salmon station on the Penobscot river, at Orland, Me., and were forwarded to the hatchery at Cold Spring Harbor, Long Island, which, while a station of the New York Fish Commission, does some work for the general government, which bears a portion of the expense. The number of fish planted in the river, your association has already received from your vice-president, Mr. A. N. Cheney, to whose great interest in these experiments we owe much information regarding the existence of the fish in the river. Mr. Cheney first sent us specimens of about seven inches long from Clendon brook, near Glens Falls, and has kept us advised of all that he has seen or heard of the fish. Last summer there were five, if not six, adult salmon taken in the river, one of which weighed sixteen and one-half pounds. Some of these fish were taken near the Troy dam, one down at Coxsackie, and one in Gravesend bay at the mouth of the river; the latter a fish of ten pounds. I think that all the fish were taken in nets, but have no definite information concerning this.

It has been the policy of Prof. Baird not to interfere in any way, as I understand him, with State laws for the capture of fish. He supplies millions of fry of different kinds to many parts of the United States, wherever he thinks the waters are suitable, and then considers that he has done his duty, and it rests with the people whose waters are stocked to protect the fish placed therein. In making the following suggestions, therefore, I ask to be considered merely as a member of the association, of which you are president, and not in any official capacities as Prof. Baird's assistant in this matter, or as a superintendent of the New York Fish Commission.

It is well known that the Hudson was not an original salmon river, but that may have been on account of the obstructions which debarred the way of the parent fish to its upper waters, where we now have positive evidence that the young salmon thrive in the cool brooks which supply the river above Glens Falls, threfore, as the experiment of stocking the river was not a very expensive one, Professor Baird thought it well worth trying, and the results so far are encouraging. It is not at all likely that every fish which returned to the river last year was captured, therefore we can not say how many did return. Had only one been caught it might have been thought a stray fish which had come down from some of the Connecticut rivers; for at intervals of many years a single salmon has been taken in the shad

nets of the lower Hudson, but on no occasion that I know of has ever more than one been taken in a single year. The fish captured last summer appearing just four years after our small planting in 1882, may with certainty be credited to our work, and I look forward to see the run increase yearly.

To properly protect these fish until such time as we may be enabled to obtain the salmon eggs from the Hudson, it would be well, in my opinion, to prohibit their capture by any means whatever, for a period of four or five years, and after that to allow them to be taken by hook and line only, making it a misdemeanor for any person to retain a salmon in his possession, or to kill it, or to sell it to another if it is accidently captured in a net used in taking other fish, or in other words compelling the person to return the fish to the water alive. I am aware that should such a law be passed, those persons who were disposed to disregard it would not report their captures, and we would be deprived of the encouragement of further stocking which such reports give; but this is a secondary consideration to the preservation of this valuable fish, and however gratifing such reports may be to the fish-culturist, we would be unwise to counsel unrestricted fishing in order that he might receive such evidence of the success of his work.

Another thing needed is a system of effective fish-ways which will allow the salmon to reach the mountain brooks, where alone they find suitable breeding grounds. There is something which is called a fish-way, or was built for one, in the dam at Troy, but is wholly useless. I think it is a mere timber chute built years ago, and is of a pattern that never worked well. The modern fish-ways, such for instance as the McDonald, will give free passage to the fish and will pass them safely to the waters above, provided they are not netted or speared while in the fish-way. Above Troy there are several dams and natural falls which, if I remember rightly, are something like eighty or ninety feet in the aggregate, and these can probably be supplied with fish-ways of modern construction at a cost of $10,000 to $12,000. I have not figured closely on this subject of cost, but estimates can easily be obtained from men who are more expert in the matter of building fish-ways.

It is among the possibilities that if the salmon ascend to the waters of the upper Hudson, they can also be established in the tributaries of the Mohawk. The West Canada creek would make a splendid salmon river, and the few dams upon it could easily be overcome by fish-ways. The principal obstruction is, of course, at Cohoes, where the total height to be overcome is somewhere between 110 and 130 feet, and the cost there would probably be more than for the whole Hudson.

While on the subject of fish-ways, I would say that the Salmon river emptying into Lake George at Pulaski, was formerly a famous salmon stream, but of late years it has very much deteriorated, although a few are taken in it almost every year. I have also made plantings of salmon fry in this river, by direction of Professor Baird, but find that the people there attribute the falling off in the catch of salmon to the erection of dams. There is a dam near Pulaski, about eleven feet high, which has the foundations for a fish-way already laid, and it is possible that a proposal to build a first-class fish-way on that river would enlist the sympathy of residents in the western part of the State, and that their representatives would join a movement to erect fish-ways on all the streams of the State which contain salmon.

In this connection permit me to call your attention to the experiment of restocking the Connecticut river with salmon. It was originally a splendid, natural salmon stream, but under a system of netting, spearing and murdering the fish, even on the spawning beds, the last fish disappeared, and some twenty-five years had elapsed, I think, since the salmon had been taken in it, when Prof. Baird and some of the New England fish commissioners thought it worth while to try and restock the river. Four or five years after the first planting a few fish were seen in the river. The year following some forty or fifty were taken. I can not give the exact figures, for I am writing from memory, and for three years after, comparatively large numbers of salmon were sent to the New York market, and Connecticut river salmon were common in New York. I have seen ten or a dozen at a time on the slabs at Mr. Blackford's in Fulton market. The fish were taken in nets and pounds at the mouth of the river, and few or none were allowed to reach the breeding grounds. The plantings were stopped, and the fish have gradually disappeared. I can not recall when the last plant was made, but it must have been six or eight years ago, and now an occasional salmon surprises the shad fishermen in the Connecticut. It is possible that this history may be repeated in the Hudson unless an effort is made to protect the few fish resulting from the first plants, and access to the spawning grounds be furnished them.

Very respectfully yours.

FRED MATHER.

In a note commenting on this, Dr. Ward said: "I am thoroughly satisfied that Mr. Mather greatly underestimates the number of salmon taken in the Hudson last season. From reliable information I believe that at least thirty adult fish were taken, and perhaps fifty."

In *Forest and Stream* of May 12, 1887, two salmon are recorded as taken at the eastern end of Long Island on May ninth, while on the day previous a fifteen pound salmon was taken in New York bay. In the issue of May twenty-sixth, a seventeen-pounder is credited by Game Protector Mathew Kennedy at Hudson city, and an eighteen-pounder at Red Bank, N. J. In the same journal, July fourteenth, it is stated that "State Game Protector Mathew Kennedy, of Hudson, furnishes the following list of salmon taken in the Hudson river this season: One fish of eight pounds at Kingston Point, by John Mahoney; one of eighteen pounds at Port Ewing, by Al. Munson; one of fourteen and a half pounds at Tivoli, by Christopher Coon & Co., and one by himself, at Hudson, of seventeen pounds. We have recorded the latter fish before, and it was taken before the passage of the law forbidding their capture in nets, but we have not the dates of the other captures. They were probably taken during the shad season, and before the new law went into effect." *

Through Mr. A. N. Cheney, of Glens Falls, Mr. J. W. Burdick, general passenger agent of the Delaware and Hudson Canal Company's railroad, gave free transportation to all fish, salmon and other, from Albany north; and Mr. C. E. Durkee, superintendent of the Adirondack railroad, extended the same courtesy over his road.

SAIBLING.

This is a beautiful trout (char), inhabiting both lakes and streams of Germany. It grows to a weight of ten or more pounds in the lakes. While in Germany I saw many young fish at the hatchery at Hueningen, in Alsace, and before leaving Bremen, Herr von Behr had a five pound specimen sent to me for dinner. It resembled our chars (brook and lake trout) in flesh, but was a brilliant crimson up to the lateral line. Half a dozen guests partook of it and found it excellent.

We received 20,000 eggs from Herr von dem Borne, Bernenchen, on February ninth, of which 8,000 were dead. On March ninth, we received 20,000 from Herr von Behr, president of the German Fishery Association, of which 5,000 were dead. These eggs were consigned to the United States Fish Commission, and under orders I shipped 3,000 to Colonel E. B. Hodge, of the New Hampshire Commission, and 15,000 to Frank N. Clark, Northville, Mich. This left us 9,000 eggs to be accounted for, and we find by the daily records that 2,463 eggs were picked out, and that 1,665 fry died. The remainder, 4,872 fry were left. These we placed in a rearing pond with native brook trout

* This law forbids the capture of salmon in the Hudson except with hook and line.

but not one is left in the fall when we overhaul the ponds. This trout is the *Salmo salvelinus* of authors, but, under the revised nomenclature of American Ichthyologists would be called *Salvelinus salvelinus*, or the typical char.

WHITE-FISH.

On January twentieth we received from the United States Fish Commission station at Northville, Mich., Frank N. Clark, superintendent, one case containing one million white-fish eggs in good condition. Three hundred thousand of these were planted in Sylvan lake, Dutchess county, on application of Mr. Charles A. Storm, and the remainder went in Long Island waters.

ADIRONDACK FROST-FISH.

This fish is one of the *Coregoni*, closely related to the above mentioned white-fish, and not at all connected with the "frost-fish" of Long Island, which is the tomcod. We received 210,000 eggs from the station at Lake Brandon, and planted all the fry, 200,000, in Sylvan lake, Dutchess county, on application of Mr. Storm.

LAND-LOCKED SALMON.

On March tenth we received 40,000 eggs from the United States station at Grand Lake stream, Maine, W. O. Buck, superintendent. On application of Mr. A. N. Cheney, of Glens Falls, we sent him 25,000 fry, and he planted 15,000 in Clendon brook, Warren county, and 10,000 in Lake George. The remainder were kept for experiment at the hatchery, but have not done well, only a few hundred having survived.

RAINBOW TROUT.

On February twenty-second we received 30,000 eggs from the Caledonia station. Of these 10,000 were sent to Commissioner Blackford for reshipment to Germany, and 10,000 to Col. E. B. Hodge, Fish Commissioner, Plymouth, N. H., in exchange. The remaining 10,000 were hatched and distributed, as per table.

SUNAPEE TROUT.

This fish, newly discovered in Sunapee lake, New Hampshire, is closely allied to the blue-backed trout, *S. oquassa*, of Maine. The latter seldom exceeds a quarter of a pound in weight, while the Sunapee fish grows to ten pounds. Colonel E. B. Hodge, of the New Hampshire Fish Commission, sent us 10,000 eggs of this fish on March thirtieth. They hatched well but the fry were not strong and all but 300 died before taking food. The latter were placed in a small pond

but disappeared before July. A peculiar mark of the fry was a white line on each side of the caudal fin, which I do not remember to have seen in the *oquassa* trout, which I have hatched.

GRAYLING.

We received from France a package containing 10,000 eggs of the European grayling in very bad condition. Nearly all had hatched and died on the journey, and the decaying mass had generated heat sufficient to impair the vitality of the rest. We picked out 300 eggs that looked the best and a few of them hatched but did not live.

WHITE PERCH.

On May eleventh we found 2,000 eggs laid on grass in St. John's lake and placed them in the jars where they began hatching the next day. On the twelfth we caught one male and two females. Took 5,000 eggs which hatched in four days. We had no screens fine enough to hold the almost microscopic fry and they passed through the ponds into the harbor.

SHAD.

From the U. S. Fish Commission we received over 6,000,000 eggs of shad and planted 2,644,000 fry. The season on the Potomac and Chesapeake rivers was the greatest ever known for the production of eggs since the beginning of fish culture, Col. McDonald reporting the output in fry, after deducting loss in transportation, as over one hundred and eight millions (108,425,000). We received in all 6,644,000 in three lots, as follows : May eighth, Transportation Car No. ———, in charge of J. F. Ellis, delivered at hatchery 2,414,000 eggs packed in crates, condition good ; this lot hatched well. May sixteenth received 2,029,000 eggs, condition good ; hatched well. May twenty-fourth received 2,201,000 eggs, all dead. The table of distribution will show where the fry were planted.

REARING SHAD IN CONFINEMENT.

We had a pool next the hatchery which received a leakage from the reservoir, and in which we used to throw dead eggs, to be eaten by the fish and birds. In taking great masses of dead shad eggs from the hatching jars many good eggs would adhere and some of these hatched in the pond. On August sixteenth we netted the fish out and the first haul brought a young shad three inches long, which died before being discovered. Two more were caught which were put in a rearing pond but were dead next morning.

I immediately wrote Prof. G. Brown Goode, U. S. Fish Commissioner, as follows:

COLD SPRING HARBOR, N. Y., *October* 1.

Prof. G. BROWN GOODE, *Commissioner of Fisheries, Washington, D. C.:*

DEAR SIR.—I have had an unusual experience with shad during the past season, which I deem worthy of reporting. On May last I received from Central Station, in Washington, several consignments of shad eggs, to be hatched at this station and distributed. Adjoining the hatchery was a little pool, fed by a spring and inclosed by a lath fence, where I kept several domesticated wild fowl, such as wood-ducks, teal, etc., but no mallard nor black ducks. In the water were a pair of large carp, weighing perhaps six or seven pounds each, which bred during the summer, as did also some goldfish — the ducks not appearing to trouble them at all. It was a convenient place for us to throw dead fish eggs, which were devoured by the small fish, and in the course of our hatching we made several deposits here of shad eggs which were in bad condition. In handling these and running off the bad ones there always are, as you are aware, a few good eggs adhering in the masses of bad ones. About the middle of August I had occasion to drain this pond, which, by the way, was only about twenty feet in diameter, and was provided with a coarse outlet screen, merely sufficient to confine the ducks and large carp, and to our astonishment we found three young shad among the other fishes. At the first haul we caught one, which was dead by the time we took it from the other hardy fish, and placed it in alcohol. The next haul we were on the lookout for shad, and caught two live ones, which we carefully dipped up and placed in one of our rearing ponds with some trout about their own size, but they were dead the next morning. There is no way that young shad could have got into this pond except from the eggs placed therein, as the fish do not run up to spawn in this harbor, nor is there any doubt in my mind as to the species, the saw-belly, which marks the family, being distinctly visible, as is also the prolonged sub-orbital bone which distinguishes the species. This is the first instance within my knowledge of shad being grown to any size in confinement. Should you wish one or all of these fish they will be forwarded at once.

Very truly yours.

FRED MATHER.

Here was a new discovery! Shad could be reared in confinement! If three had lived under these conditions why could not more? I would raise shad in preserves where their enemies could not destroy them in their infancy, and thus revolutionize shad-culture!

A chill succeeded this excitement, which was brought on by the following letter:

UNITED STATES COMMISSION OF FISH AND FISHERIES,
WASHINGTON, D. C., *October* 4.

FRED MATHER, ESQ.:

DEAR SIR.—In reply to your interesting letter in regard to the rearing of shad to considerable size at the Cold Spring Harbor station, I am requested by Professor Goode, commissioner, to let you know what we ourselves have done in the matter. For several years past we have obtained in the fall of the year, when we have drawn our pools in the yard, a number of young shad, from two to three inches long, which were introduced there during the hatching season as fry, the pool having been used to wash out the cans and pans used in handling fry. In 1885 I made the experiment of stocking one of the carp ponds in Washington with about 30,000 shad fry, which were hatched out and sent down from Central station. The ponds were drawn the following autumn to collect the carp, and from them were obtained and counted upward of 7,000 shad, ranging in length from two and one-half to five inches. Since some shad were obtained from the pond in seasons when no fry were introduced, the experiment, although suggestive, was not conclusive. To repeat it under conditions which absolutely excluded all chance of error or possibility of introduction of the fry accidentally or by design, we sent 30,000 fry by messenger a distance of 300 miles to Wytheville, Va., which were placed in a freshly-dug pond about one-tenth of an acre in area, and which was fed by surface water from a running stream. In September of this year, in presence of Professor Goode, I had the pond drawn, and find by actual count nearly 2,500 young shad, from one and one-half to four and one-half inches in length. Although the percentage attaining this age was large, I am satisfied that more than half the shad that were in the pond escaped during the time it was being drawn, since when the pond was nearly empty we discovered an opening around the screen which permitted the shad and carp, which were also in the pond, to pass through in the several hours during which the pond was being emptied. Doubtless, double as many shad escaped from the pond as were recovered and counted from it. Acting upon the suggestion offered by this experiment, I propose, during the ensuing year, to reserve the large pond at the carp ponds for the purpose of making the experiment of holding and rearing the shad for several months. This pond has an area of about six acres, and will be stocked with several million fry. Care will be taken to exclude all other fish from the pond, and, as far as practicable to do

so, to secure an abundant growth of vegetation in the pond to serve as nurseries for the food upon which the young fry feed. In the light of experiments already made we would have reason to expect from this experiment to be able to turn out in the Potomac in October, at least twenty per cent of the fry placed in it in the spring, which would then be fish from three to five inches in length. We will certainly be able to give back to the Potomac each year several times as many mature shad as are taken from it by the fishermen, and these will be of such a size and vigor of movement as to be comparatively safe from capture by the other fish. The results of the experiment made in 1885 will be found in the Bulletin of the United States Fish Commission for 1886, page 441.

Very truly yours.

M. McDONALD,

Chief of Division of Distribution.

COLD SPRING HARBOR, N. Y., *October* 11, 1887.

COL. M. McDONALD:

DEAR SIR.—I have your letter of October 4. I would like permission to publish what you say about rearing shad in confinement, in *Forest and Stream* and in the next State report. It is very interesting to know that shad can be reared in ponds. I thought I had made an original discovery. One trouble with breeding them will be their disposition to die when handled. * * *

Very truly yours.

FRED MATHER.

WASHINGTON, D. C., *October* 12, 1887.

FRED MATHER, ESQ.:

DEAR SIR.—I will be glad to have you publish what I have written you in regard to our experiments in rearing shad in confinement. What you say in regard to their delicacy in handling is a very important matter. The experiments we propose to conduct next year will be in a pond of six acres, communicating directly with the Potomac river, and when we find it desirable to turn out the fish, say sometime in October, the gates communicating with the river will be opened at high tide so as to permit the fish to pass out with the ebb of the water. We will in this way transfer them without any possi-

bility of risk in handling. I look for most important results in our shad work from the extension of this method of rearing in large ponds in connection with our shad streams. Work already done has certainly been very effective, but I believe that returns from work of this character will be much larger in proportion to the expenditure.

Very truly yours.

M. McDONALD.

The following extract from the Bulletin of the United States Fish Commission, entitled a "Report on Examination of *Clupeoids* from Carp Ponds," by Dr. Tarlton H. Bean, curator department of fishes, is the one referred to by Colonel McDonald, it says: "I have to-day reëxamined the *Clupeoids* which were sent over in large numbers from the carp ponds in November and December, 1885, and desire to present herewith a brief report upon them. * * * On the 10th of December, 1885, Mr. Hessel sent over upwards of 7,000 *Clupeoids*, consisting almost entirely of shad. In a half-gallon jar, selected at a random from the mass of fish and preserved in alcohol, I have counted forty-eight shad ranging in length from four to five inches. * * * Shad have been obtained in the United States carp ponds before last year; for example, on November 6, 1880, we received a lot of which I preserved twenty-three individuals ranging in length from six to six and five-eighths inches. There has not, however, been such a multitude of shad in the carp ponds until last year, as far as observation goes, and we are justified in believing that this mass is the result of an experiment by Colonel M. McDonald, in April, 1885, at which time about 10,000 young shad were introduced into one of the ponds * * *."

In our case there was no possibility of the shad coming up from the harbor, for no shad come there. The protection afforded the young fish may prove that this is the best method of stocking shad rivers. It is not possible to handle either young or old shad as some other fishes are handled because they die if touched or taken out of water for an instant, yet they may be released as Colonel McDonald says, by opening ponds and allowing them to swim out, and I think it worth a trial at this station next year.

TOMCODS.

We made the important discovery that the eggs of this fine little fish can be hatched in fresh water. By accident our salt-water was stopped and we shifted the rubber tubes of the jars to the fresh water pipe and the fish not only hatched but lived until the sac was absorbed

and they were planted. I had some correspondence after this, with a gentleman who wished to introduce them into a fresh-water lake, the following letter is part of it :

NEW HAMBURG, N. Y., *January* 24, 1887.

MR. FRED MATHER, *Superintendent:*

DEAR SIR. — One day last week I had the good luck to get hold of about 100 tomcods, or "frost-fish" as they are sometimes called, and put them in Sylvan lake to spawn, and make food for the salmon-trout. The fish were full of spawn, some of them ripe. They come up the Hudson to spawn, the same as the smelt. Don't you think this fish will answer my purpose as well as the smelt? Will it become land-locked, or will it perish? * * *

Very truly yours.

P. A. M. VAN WYCK.

I replied to Mr. Van Wyck that it was possible that this fish might prove valuable in fresh water as food for trout as all its fins are soft, but that I lacked the necessary experience to give a categorical answer to his questions. I believe, however, that the little *Microgadus tomcodus** will prove of value in fresh-water lakes. The spawning season last year extended from December fifteenth to January fourth, and our notes show that "one jar containing 500,000 eggs taken December fifteeth, sixteenth and seventeenth, began hatching on January tenth; half were hatched by January fifteenth, and all were out on February ninth; in fresh water most of the time."

SMELTS.

Many smelts were taken in this harbor and in Oyster bay, and are credited to our hatching operations, as they did not frequent these waters. We obtained our spawning fish from Brookhaven, on the Conetquot river on the south side of Long Island. We took eggs on gravel and on grass and also took many and let them bunch in the hatching jars. The latter did the best, and there is nothing to add to my notes on smelt hatching in previous reports.

CONCLUSION.

The station needs more ponds to accommodate the increase of breeding fish, and the grounds, although greatly improved by shell walks and sod about the ponds, need grading and filling up in many places.

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*This is not a joke but is the scientific name of the fish, according to Gill, Walbaum *et al.*

The station being near New York city is a handy one for visitors and all who come to America to study fish culture come here. We have had Mr. K. Ito, Superintendent of Fisheries of Japan; Dr. Filip Trybom, Fish Commissioner of Sweden; Professor Alberto R. Alvarez, of Spain; Professor Cossar Ewart, of the Edinburg University; Dr. Adolph N. Nielsen, Fishery Assistant of Norway; Mr. Henry Grosjean, of France, and others who came to visit the hatchery and study fish culture.

We have exterminated the water tortoises and have thinned the kingfishers and muskrats, but the roving minks still visit us and the pest of eels, the worst enemies we have, has been modified but not abated. A vigilant watch is kept for eels, yet when we drain a pond there are always a few to be found.

Very respectfully.

FRED MATHER.

Superintendent.

TABLE I.

DISTRIBUTION OF BROOK TROUT FROM COLD SPRING HARBOR IN 1887.

DATE.	Number of fish.	Sent to	Post-office address.	For what streams.	Messenger.
April 15	500	W. S. Allen	940 Broadway, New York city	At Bay Side, L. I.	Long Island Express Co.*
15	3,000	Kept at hatchery.			
25	*5,000	Charles Fleischman	Griffin's Corners, N. Y.	In Delaware county	Long Island Express Co.
30	3,000	L. D. Huntington	Smithtown, L. I.	In Suffolk county	Long Island Express Co.
May 2	2,500	Hewlett Scudder	Northport, L. I.	In Suffolk county	Consignee.
3	5,000	W. Floyd-Jones	Seaford, L. I.	At South Oyster Bay	Long Island Express Co.
3	2,000	W. A. Brown, Superintendent	Seaford, L. I.	Massapequa lake	Long Island Express Co.
3	5,000	Charles A. Storm	New Hamburg	In Dutchess county	F. T. Martin.
3	5,000	John D. Jones	Seaford, L. I.	At South Oyster Bay	Long Island Express Co.
3	†47,446	F. T. Underhill	Oyster Bay, L. I.	Private ponds	Owner.
4	10,000	E. W. Addis	Brewster, N. Y.	In Putnam county	Long Island Express Co.
4	5,000	M. W. Hazleton			Long Island Express Co.
4	2,000	S. K. Satterlee	15 Maiden lane, New York city	In Westchester county	Long Island Express Co.
4	5,000	John D. Hewlett	Cold Spring Harbor, L. I.	Mill ponds	Owner.
5	2,000	S. S. Stevens	Brooklyn	In Suffolk county	Long Island Express Co.
6	500	Herman Otto	Otisville, N. Y.	In Orange county	Long Island Express Co.
7	10,000	F. T. Wheeler	Roscoe, Sullivan county	In Sullivan county	Long Island Express Co.
7	2,000	John Cashow	Locust Valley, L. I.	In Queens county	Owner.
9	5,000	Benjamin H. Avery			Long Island Express Co.
12	7,000	C. E. Quinlan	Flushing, L. I.	In Queens county	Long Island Express Co.
13	10,000	Brooklyn Gun Club	Smithtown, L. I.	Club ponds	Long Island Express Co.
13	3,000	Kept at hatchery.			
18	1,000	J. W. Beekman	Oyster Bay, L. I.	Private pond	Owner.
19	5,500	C. E. Durkee	Saratoga	In Warren county	O. V. Rogers.
Total	145,946				

* In this, as in some other cases, the consignee met the fish at Long Island City.

† Mr. Underhill bought 50,000 eggs from James Annin, Caledonia, N. Y., and W. L. Gilbert, Plymouth, Mass., and they were hatched for him without charge.

TABLE II.

DISTRIBUTION OF BROWN TROUT FROM COLD SPRING HARBOR IN 1887.

DATE.	Number of fish.	Sent to	Post-office address.	For what streams.	Messenger.
May 3.....	2,000	W. A. Brown, Superintendent..	Seaford, L. I.....	Massapequa lake.....	Long Island Express Co.
4.....	5,000	W. Holberton.....	18 Vesey street, New York city,	At Bellmore, L. I.....	Long Island Express Co.
4.....	2,000	John D. Hewlett.....	Cold Spring Harbor.....	St. John's lake.....	Consignee.
19.....	10,000	Oxford Club.....	Patchogue, L. I.....	Club ponds.....	Long Island Express Co.
19.....	5,000	C. E. Durkee.....	Saratoga, N. Y.....	In Warren county.....	O. V. Rogers.
19.....	5,000	A. N. Cheney.....	Glens Falls, N. Y.....	In Warren county.....	O. V. Rogers.
20.....	10,000	Kept in ponds.			
Total.....	39,985				

TABLE III.

DISTRIBUTION OF LOCH-LEVEN TROUT FROM COLD SPRING HARBOR IN 1887.

DATE.	Number of fish.	Sent to	Post-office address.	For what streams.	Messenger.
May 3.....	1,000	Charles A. Storm.....	Clove Branch.....	In Dutchess county.....	F. T. Martin.
5.....	3,000	Kept at hatchery.			
15.....	12,000	Kept at hatchery.			
9.....	500	Miss Marbury.....	Oyster Bay.....	Private pond	Consignee.
19.....	5,000	A. N. Cheney.....	Glens Falls.....	In Warren county.....	O. V. Rogers.
Total.....	21,500				

TABLE IV.

SALMON (PENOBSCOT, ME.,) DISTRIBUTED FROM COLD SPRING HARBOR IN 1887.*

DATE.	Fish supplied.	Loss in transportation.	Fish planted.	Stream.	Tributary of	Messenger.
April 18.....	50,000	300	49,700	Balm of Gilead	Hudson river	O. V. Rogers.
20.....	50,000	500	49,000	Carrs brook	Hudson river	C. H. Walters.
25.....	50,000	500	49,500	Raymond brook	Hudson river	O. V. Rogers.
28.....	42,150	400	41,750	North creek	Hudson river	C. H. Walters.
May 2.....	50,000	500	49,500	Salmon river.....	Lake Ontario	O. V. Rogers.
Total.....	242,150	2,200	239,950			

*The expense of hatching and planting salmon was paid by the United States Fish Commission, and this table does not include 50,000 sent to the Housatonic river from this station.

TABLE V.

SAIBLING DISTRIBUTED FROM COLD SPRING HARBOR IN 1887.

DATE.	Number of fish.	Sent to	Post-office address.	For what streams.	Messenger.
May 8.....	500	Charles A. Storm.....	Clove Branch	In Duchess county	F. T. Martin.
4.....	1,000	John D. Hewlett.....	Cold Spring Harbor	Mill ponds.....	Consignee.
19.....	2,000	A. N. Cheney	Glens Falls.....	In Warren county	O. V. Rogers.
20.....	1,500	Kept at hatchery.			
Total.....	5,000				

TABLE VI.

WHITE-FISH DISTRIBUTED FROM COLD SPRING HARBOR IN 1887.

DATE.	No. of fish.	Where planted.	Messenger.
March 7	400,000	St. John's lake, Suffolk county.....	C. H. Walters.
21	300,000	Sylvan lake, Dutchess county.....	O. V. Rogers.
22	250,000	Escaped from hatchery.	
Total..	950,000		

TABLE VII.

FROST-FISH (ADIRONDACK) DISTRIBUTED FROM COLD SPRING HARBOR IN 1887.

DATE.	No. of fish.	Where planted.	Messenger.
March 21	200,000	Sylvan lake, Dutchess county.....	O. V. Rogers.

TABLE VIII.

LAND-LOCKED SALMON DISTRIBUTED FROM COLD SPRING HARBOR IN 1887.

DATE.	No. of fish.	Where planted.	Messenger.
May 19	15,000	Clendon brook, Warren county.....	A. N. Cheney.*
19	10,000	Lake George, Warren county.....	O. V. Rogers.
20	11,950	Kept at hatchery.	
Total..	36,950		

* Clendon brook is a tributary of the Hudson, and is preserved. Mr. Cheney took the fish from Mr. Rogers at Glens Falls, and the latter went on to Lake George.

TABLE IX.

RAINBOW TROUT DISTRIBUTED FROM COLD SPRING HARBOR IN 1887.

DATE.	Number of fish.	Sent to	Post-office address.	For what streams.	Messenger.
May 3	1,000	Charles A. Storm	Clové Branch	In Dutchess county	F. T. Martin.
3	1,000	W. A. Brown	Seaford, L. I.	Massapequa lake	Long Island Express Co.
4	1,000	S. K. Satterlee	15 Maiden lane, New York city	In Westchester county	Long Island Express Co.
20	5,000	Kept in ponds.			
Total	8,000				

TABLE X.

TOMCOD DISTRIBUTED FROM COLD SPRING HARBOR IN 1887.

DATE.	Number of fish.	Where planted.	County.	Planted by
January 19	500,000	Cold Spring Harbor	Queens and Suffolk	Fred Mather.
31	500,000	Cold Spring Harbor	Queens and Suffolk	C. H. Walters.
February 1	1,000,000	Cold Spring Harbor	Queens and Suffolk	C. H. Walters.
9	1,000,000	Cold Spring Harbor	Queens and Suffolk	O. V. Rogers.
19	400,000	Cold Spring Harbor	Queens and Suffolk	Fred Mather.
Total	3,400,000			

TABLE XI.

SHAD DISTRIBUTED FROM COLD SPRING HARBOR IN 1887.

DATE.	Number of fish.	Place of deposit.	River.	Tributary of	Messenger.
May 16	1,000,000	Albany	Hudson	Atlantic	C. H. Walters.
16	200,000	Cold Spring Harbor	Trout ponds	Long Island Sound	
16	300,000	Smithtown, L. I.	Nissequogue	Long Island Sound	Peter Gorman.
23	844,000	Brookhaven, L. I.	Connetquoit	Atlantic	Charles P. Dole.
23	300,000	Smithtown, L. I.	Nissequogue	Long Island Sound	Peter Gorman.
Total	2,644,000				

TABLE XII.

SMELT DISTRIBUTED FROM COLD SPRING HARBOR IN 1887.

DATE.	Number of fish.	Where planted.	Planted by
April 10	500,000	At head of Cold Spring Harbor	Fred Mather.
25	500,000	At head of Cold Spring Harbor	C. H. Walters.
30	1,000,000	At head of Cold Spring Harbor	C. H. Walters.
Total	2,000,000		

TABLE XIII.

WHITE PERCH DISTRIBUTED FROM COLD SPRING HARBOR IN 1887.

DATE.	Number of fish.	Where planted.	Planted by
May 16	6,000	Cold Spring Harbor	

TABLE XIV.

TOTAL NUMBER OF FISH PLANTED FROM COLD SPRING HARBOR IN 1887.*

Brook trout	145,946
Brown trout	39,985
Loch-Leven trout	21,500
Penobscot salmon	242,150
Saibling	5,000
White-fish	950,000
Frost-fish (Adirondack)	200,000
Land-locked salmon	36,950
Rainbow trout	8,000
Shad	2,644,000
Tomcods	3,400,000
Smelts	2,000,000
White perch	6,000
	9,699,531

*See note under Table IV.

TABLE XV.

TEMPERATURES OF WATER AT COLD SPRING HARBOR, 1886–7.*

SEASON OF	Number of days.	Highest temperature.	Lowest temperature.	Mean temperature.
Trout	November 4 to May 19, 196 days	May 3 to 20, 66°	January 2, 32°	43.27°
Salmon†	February 3 to May 20, 106 days	May 3 to 20, 66°	February 13, 33°	46.60°
Smelt	February 25 to April 30, 65 days	Many days, 57°	Many days, 36°	44.50°
Tomcod	December 15 to February 19, 66 days	Many days, 40°	January 2, 32°	37.70°
Shad†	May 8 to May 23, 16 days	..... 66°	..... 66°	66°
White perch	May 11 to May 16, 6 days	..... 66°	..... 66°	66°
White-fish	January 20 to March 22, 62 days	March 13, 46°	February 13, 33°	38.63°

* The periods cover the time of taking, or receiving eggs, to the absorption of the yolk-sac. The temperatures are given in Farenheit's scale.
† These eggs were received from the United States Fish Commission, and the eyes were visible in them when they arrived.

REPORT ON THE ADIRONDACK HATCHERY.

By James H. Marks, Superintendent.

To the Commissioners of Fisheries:

In accordance with instructions received, I transmit to you my first report of work done during the past nine months at the Adirondack hatchery, situated on Little Clear pond or Lake Brandon, in the town of Brandon, Franklin county, N. Y. I can not report as to the work done during December, 1886 and January and February, 1887, as I took charge March 1, 1887. February 23, 1887, I received orders from R. U. Sherman, commissioner in charge, to proceed directly to the Adirondacks and take charge of the hatchery. I left Caledonia, N. Y., February 24, 1887, arriving here March 2, 1887, being detained four days on the road by one of the heavy snow storms which frequently prevail during that season of the year. I found a well established hatchery and everything in perfect order. All the eggs and fry were clean and looking healthy. There was an inventory taken of the number of eggs then on hand, as shown in the following table:

Salmon-trout	400,000
Brook trout	200,000
White-fish	130,000
Penobscot salmon*	250,000

I received March tenth a shipment of land-locked salmon eggs from James O. Buck, Grand Lake Stream, Maine, and on unpacking found 100 dead eggs; temperature of package forty, of water thirty-eight. They hatched April twentieth, and I think were the finest eggs and did better than any I ever tried to hatch. The work done from March 3 to November 30, 1887, is as follows: A barn has been built, twenty-six by thirty, which has all the modern improvements and will accommodate four horses and a cow, with plenty of room on the upper floor to store hay and straw for winter use; also a woodshed and ice-house combined, which is eighteen by thirty, and was constructed with comparatively small cost, not exceeding $100 for lumber and carpenter work, as there was plenty of old lumber on hand which was used in

*See table of distribution.

place of new for the purpose of lining the inside of the building, and for the part which is for ice old lumber will last about as long as new, making a saving of about $200. The outside is clapboarded two and one-half inches to the weather, which makes a good, substantial wall, and, with two coats of paint, it is a very respectable looking building. Other work has also been done about the hatchery and grounds, such as grading and cleaning out the underbush back of the cottage, which makes it more pleasant and gives a better view of the creek. A dam has been built across the main brook to prevent the trout from running up to the upper dam and getting under the apron, where it would be difficult to capture them, and to prevent them from working over the lower dam I have placed a screen one foot high and extending the whole length of it; below in connection with this is a spawning race twenty-five feet long and twelve feet wide, which has proved a success. The gill nets were all mended, and the trap nets bought of A. A. Kench & Co. were enlarged and new ones made. The extra iron feed pipe that is not in use has been given a coat of coal-tar to prevent rusting, and everything was in readiness on the first of October to open the fall campaign with the finny tribe.

DISTRIBUTION OF SALMON-TROUT FROM ADIRONDACK HATCHERY, 1887.

April 21. 30,000, Rainbow lake, Franklin county; ordered by James M. Wardner; P. O., Rainbow, N. Y.; delivered by James M. Wardner.

25. 50,000, Upper Saranac lake, Franklin county; ordered by D. W. Riddle; P. O., Saranac, N. Y.; delivered by James H. Marks.

28. 40,000, St. Regis lake, Franklin county; ordered by Paul Smith; P. O., Bloomingdale, N. Y.; delivered by James H. Marks.

May 2. 30,000, Chateaugay lake, Franklin county; ordered by Isaac Chesley; P. O., Bloomingdale, N. Y.; delivered by Isaac Chesley.

2. 30,000, Lower Saranac lake, Franklin county; ordered by Milo B. Miller; P. O., Saranac, N. Y.; delivered by Milo B. Miller.

3. 30,000, Meacham lake, Franklin county; ordered by A. R. Fuller; P. O., Duane, N. Y.; delivered by George Selcurk.

4. 30,000, Big Clear pond, Franklin county; ordered by Commissioner R. U. Sherman; P. O., New Hartford, N. Y.; delivered by James H. Marks.

May 5. 25,000, Lake Placid, Essex county; ordered by George H. Stevens; P. O., North Elba, N. Y.; delivered by J. R. Stevens.

6. 5,000, Round pond, Essex county; ordered by Weston & Otis; P. O., Keene, N. Y.; delivered by J. H. Otis.

10. 25,000, Chazy lake, Clinton county; ordered by Storrs and Rodgers; P. O., Dannemora, N. Y.; delivered by Charles Rodgers.

12. 50,000, Lake Brandon, Franklin county; ordered by Commissioner R. U. Sherman; P. O., New Hartford, N. Y.; delivered by John G. Roberts.

15. 40,000, Hoel pond, Franklin county; ordered by Commissioner R. U. Sherman; P. O., New Hartford, N. Y.; delivered by James H. Marks.

17. 10,000, McKenzie pond, Essex county; ordered by Duncan Cameron; P. O., Saranac, N. Y.; delivered by Byron Cameron.

Total, 395,000

DISTRIBUTION OF BROOK TROUT.

May 1. 5,000, Chateaugay lake, Franklin county; ordered by Isaac Chesley; P. O., Bloomingdale, N. Y.; delivered by Isaac Chesley.

2. 10,000, Colby pond, Franklin county; ordered by Milo B. Miller; P. O., Saranac, N. Y.; delivered by Milo B. Miller.

4. 6,000, Lake Placid, Essex county; ordered by George H. Stevens; P. O., Keene, N. Y.; delivered by J. R. Stevens.

6. 15,000, Edmonds ponds, Essex county; ordered by Weston & Otis; P. O., Keene, N. Y.; delivered by J. H. Otis.

7. 20,000, Rainbow lake, Franklin county; ordered by James M. Wardner; P. O., Rainbow, N. Y.; delivered by James M. Wardner.

7. 10,000, McKenzie pond, Essex county; ordered by Duncan Cameron; P. O., Saranac, N. Y.; delivered by Byron Cameron.

13. 15,000, Ausable ponds, Essex county; ordered by J. K. Brown; P. O., Keene, N. Y.; delivered by John K. Brown.

May 16. 20,000, Big Clear pond, Franklin county; ordered by Commissioner R. U. Sherman; P. O., New Hartford, N. Y.; delivered by James H. Marks.

18. 30,000, Lake Brandon, Franklin county; ordered by Commissioner R. U. Sherman; P. O., New Hartford, N. Y.; delivered by John G. Roberts.

18. 25,000, Little Clear brook, Tributary to Saranac lake; ordered by D. W. Riddle; P. O., Saranac, N. Y.; delivered by John G. Roberts.

18. 10,000, Rat pond, Franklin county; ordered by C. G. Alford; P. O., New York city; delivered by Edwin Otis.

24. 5,000, St. Regis pond, Franklin county; ordered by James H. Marks; P. O., Bloomingdale, N. Y.; delivered by James H. Marks and John G. Roberts.

25. 5,000, Moose pond, Essex county; ordered by W. L. Baldwin; P. O., Bloomingdale, N. Y.; delivered by W. L. Baldwin.

25. 20,000, St. Regis pond, Franklin county; ordered by Paul Smith; P. O., Bloomingdale, N. Y.; delivered by James H. Marks.

Total, 196,000

DISTRIBUTION OF PENOBSCOT SALMON.

May 18. 100,000, Upper Saranac lake, Franklin county; ordered by D. W. Riddle; P. O., Saranac, N. Y.; delivered by John G. Roberts.

21. 30,000, Upper St. Regis lake, Franklin county; ordered by Paul Smith; P. O., Bloomingdale, N. Y.; delivered by James H. Marks.

21. 20,000, Big Clear pond, Franklin county; ordered by Commissioner R. U. Sherman; P. O., New Hartford, N. Y.; delivered by John G. Roberts.

21. 20,000, Lower Saranac lake, Franklin county; ordered by Milo B. Miller; P. O., Saranac, N. Y.; delivered by Milo B. Miller.

21. 20,000, Rainbow lake, Franklin county; ordered by James M. Wardner; P. O., Rainbow, N. Y.; delivered by James M. Wardner.

24. 20,000, Moose pond, Essex county; ordered by W. L. Baldwin; P. O., Bloomingdale, N. Y.; delivered by W. L. Baldwin.

May 24. 15,000, St. Regis pond, Franklin county; ordered by James H. Marks; P. O., Bloomingdale, N. Y.; delivered by James H. Marks and John G. Roberts.

26. 20,000, Meacham lake, Franklin county; ordered by A. R. Fuller; P. O., Duane, N. Y.; delivered by A. R. Fuller.

Total, 245,000

DISTRIBUTION OF LAND-LOCKED SALMON.

May 21. 5,000, Upper St. Regis lake, Franklin county; ordered by Paul Smith; P. O., Bloomingdale, N. Y.; delivered by James H. Marks.

21. 5,000, Lower Saranac lake, Franklin county; ordered by Milo B. Miller; P. O., Saranac, N. Y.; delivered by William Fenigan.

21. 5,000, Rainbow lake, Franklin county; ordered by James M. Wardner; P. O., Rainbow, N. Y.; delivered by James M. Wardner.

23. 10,000, Lake Brandon, Franklin county; ordered by Commissioner R. U. Sherman; P. O., New Hartford, N. Y.; delivered by John G. Roberts.

Total, 25,000

DISTRIBUTION OF WHITE-FISH.

April 21. 20,000, Big Clear pond, Franklin county; ordered by Commissioner R. U. Sherman; P. O., New Hartford, N. Y.; delivered by Willard F. Otis.

25. 50,000, Upper Saranac lake, Franklin county; ordered by D. W. Riddle; P. O., Saranac, N. Y.; delivered by James H. Marks.

May 3. 55,000, Lake Brandon, Franklin county; ordered by Commissioner R. U. Sherman; P. O., New Hartford, N. Y.; delivered by John G. Roberts.

Total, 130,000

LAKE TROUT.

The number of eggs gathered from this fish the present season was 1,139,000. This is the actual count and measurement. To procure the spawn of this fish it was thought necessary to send a man to the western lakes so that we might procure a large quantity. Therefore Mr. Roberts was appointed foreman of the expedition, being the only man I had with the required experience to perform this undesirable trip, and left here October first. The past season has been an unfavorable one for the fishermen as well as for the spawn gatherers, the first eggs taken being on October nineteenth, at Drommonds island, Lake Huron, with the prospects of a good season before them. But the rough weather, coming as it did in the very height of the spawning season, was very disastrous to the interest of the commission, and owing to the loss of nets they were obliged to abandon that locality. Fortunately, Mr. Roberts met Mr. Myers, of the United States Commission, of Alpena, who kindly gave him letters of introduction to his men stationed at Beaver island, Lake Michigan, where he met with good success, returning to the hatchery November twenty-sixth, with his eggs in fine condition.

The following table is a record kept by Mr. Roberts while engaged in gathering Lake trout spawn on Lakes Huron and Michigan, showing date of each catch from October nineteenth until the finish, November sixteenth, giving the temperature of water and air, the weight of fish caught in his boat, and the number of ripe females taken, and also of males used in fertilizing the eggs, and the number of eggs produced each day:

DATE.	Temperature of air.	Temperature of water.	Direction of wind.	Weight of catch.	Number of females, ripe.	Number of males.	Number of eggs.	Unable to lift.
October 19.....	51	51	S. E.	125	7	4	45,000	
20.....	49	50	S. E.	.....	....	....	.....	
21.....	38	49	W.	.....	....	....	.....	
22.....	34	44	N. W.	.....	....	....	.....	
23.....	33	42	N. E.	.....	....	....	.....	
24.....	34	39	N. W.	.....	....	....	.....	
25.....	26	38	N. W.	.....	....	....	.....	
26.....	33	39	S. W.	.....	....	....	.....	
27.....	45	41	S. W.	300	4	4	15,000	
28.....	46	42	N.	.....	....	....	.....	
29.....	32	39	N. E.	.....	....	....	.....	
30.....	38	40	S. W.	.....	....	....	.....	
31.....	48	42	W.	880	42	35	200,000	
November 1.....	48	42	S. W.	170	7	4	30,000	
2.....	45	40	N.	150	3	3	10,000	
12.....	44	41	N. W.	1,000	15	10	100,000	
13.....	48	42	S. E.	2,000	60	50	400,000	
14.....	45	42	N. E.	1,000	33	26	200,000	
15.....	38	40	N. W.	1,500	35	31	200,000	

BROOK TROUT.

The number of brook-trout eggs taken this season was 715,000; the time of spawning being from October tenth to November thirtieth. Five hundred and fifteen thousand of this number were taken from Little Clear brook, showing that the hatchery is situated on one of the finest trout streams in northern New York. The trout are plentiful and very large, weighing from one-half to one and one-half pounds, and many of them reaching two pounds. We have taken as many as 4,500 eggs from one of these monsters. Millard F. Otis, one of my assistants has taken the larger part of these eggs without help, showing that it is also an easy stream to work. The loss of fish has been small as trap nets were used to capture the parent fish. These nets were made of coarse sacking in place of twine. The past season has been a favorable one for our work. Other waters have been visited for the purpose of gathering brook trout spawn. The following are the names of some of these waters :

Floodwood pond, Long pond, Ausable pond, Lake Placid and Cascade lakes. I met with no success at the three first named, being unable to get experienced men to work them. Messrs. Weston & Otis, proprietors of the Cascade Lake House, informed me that they thought I could procure a large quantity of eggs at their place. I went there October eleventh and on the twelfth took 15,000 eggs ; Mr. Otis kindly giving me his assistance. I remained there two weeks; during this time I visited Lake Placid twice, Mr. Otis accompanying me and Mr. George H. Stevens, proprietor of the Stevens House, went with us and gave a helping hand, showing his good will and ability in chasing trout. October twenty-seventh I went to the upper Ausable ponds, John K. Brown going with me; we found the spawning beds, but were too late as the trout had all left for deep water. I returned to the hatchery October twenty-eighth with 150,000 eggs.

FROST-FISH.

Of these eggs we have 450,000, which were gathered at Bartlett's rapids, where they are known to be very plentiful, but this year the low water and the number of gill-nets used in the stream below by outside parties caused our failure to do as well as last year, and we were obliged to return earlier than we would have done had we full control of the stream. We subsequently took 550,000 more eggs at Big Clear pond, making in all 1,000,000. It is only in the spawning season that these fish can be taken to any extent, and therefore everyone is trying to outdo his neighbor in capturing them. It will soon be the same old query, "What has become of the frost-fish?" These eggs are cared for in the Chase jar, which does its work satisfactorily

GENERAL REMARKS.

We have the hatchery in fine working order and will have a large supply of eggs, and hope to turn out a fine lot of fish next spring. We are provided with everything that is necessary to have in order to do our work. There are other things which have to be looked after as well as the work in the hatchery. We shall cut and draw our firewood for use the coming year, and as soon as the weather in spring will permit we shall clear enough of the wild land lying west of the dwelling-house to enable us to raise oats, potatoes and other hardy vegetables. In conclusion I would say that I do not know of a place in the State of New York which has the facilities for doing as great work with brook trout as this station has.

JAMES H. MARKS,
Superintendent Adirondack Hatchery.

BLOOMINGDALE, ESSEX CO., N. Y., *December* 1, 1887.

REPORT ON THE ST. LAWRENCE HATCHERY.

By M. B. Hill, Superintendent.

H. H. Thompson, *Secretary of Commissioners of Fisheries:*

I herewith present my report for the St. Lawrence hatchery for the past year. There have been hatched and deposited in public waters about 2,000,000 of fish, and distributed as follows: In Lake Ontario, 500,000 of salmon-trout fry; in Mill Site lake, near Redwood, Jefferson county, 35,000 salmon-trout fry; in the St. Lawrence river and other waters of Jefferson county, 400,000 California or rainbow trout fry; of white-fish, ciscoes and pike-perch, about 1,070,000 deposited in Lake Ontario; of brook trout, 20,000 deposited in streams near Watertown, Jefferson county. The capacity of this hatchery is at least 5,000,000 in one year, if suitable funds were provided to carry it to its full extent I have worked for two years on a meager salary, often paying some expenses myself so as to keep within the limits of my appropriation. I have also boarded myself, except when gathering spawn or depositing fish, and donated use of hatchery and some ponds where I have kept brook and California trout, at my own expense, and used the spawn of said fish for State purposes. I do not mention these things to find fault, for the commissioners have given me all that was appropriated for this hatchery. I think $2,000 could be profitably used annually at this hatchery. The take of spawn this fall is very good, but not so many salmon-trout eggs were taken as usual, on account of heavy wind at their spawning season. The white-fish and cisco spawn is a very fair yield, and the brook trout have furnished double the amount of spawn of any previous year.

Experimenting with the mascalonge, the first female fish of the season I caught in Indian river, May thirteenth, opened and examined the spawn and then sent it to Seth Green for further examination. The eggs were small and immature. I have trolled for this noble fish many times during summer and fall. The second female opened was a St. Lawrence fish, caught in the latter part of August. The eggs were nearly twice as large as those of the Indian river fish, caught

May thirteenth, as above described. During September three female fish were opened, one by G. M. Skinner, of this place, and two by myself. The fish opened by Mr. Skinner had a large quantity of medium-sized eggs, which, I should think, would not mature before winter. The fish opened by me had larger eggs, and might mature very late in the fall. I also examined the roe sack and spawn of a fish caught in Indian river by Brayton Nichols about October first. The eggs were the largest I have seen in any of the fish. I think they would have matured during November. I have a letter from J. C. Wilson, of Watertown, which I send you in connection with this report:

WATERTOWN, N. Y., *November* 15, 1887.

M. B. HILL:

DEAR SIR.—I have the two spawn sacks from a mascalonge killed Saturday; they are very full of spawn. Are they of any value to you? If so, you are welcome to them. The fish weighed forty-five pounds and the sacks were saved whole.

Yours, etc.

J. C. WILSON,
No. 29 Arsenal street.

P. S.—The sacks are about two feet long and about three inches in diameter, and the eggs are about the size of a No. 10 shot.

I think from my experiments thus far, and from all the information I can get from old fishermen, that the mascalonge spawn from late fall to early spring, and think they vary considerable in their spawning season, perhaps more so than other fish. I think, too, that they should not be classed with the pike family. I have been keeping mascalonge for more than a year, and find that their habits and movements are very much like those of the salmon family, and not like those of the worthless *Esox lucius* or pickerel. I have one female mascalonge in my pond that had all the appearances of being filled with spawn during the summer, and especially so this fall. I had watched her very closely until October eighteenth, and am sure she had not spawned at that date. Since then I have been constantly on the go for fish spawn, and I am certain she has dropped her spawn during my absence. I discovered also, two large places on the flat rock bottom in the pond that were scoured very clean. I think the fish did this for a spawning bed. I am of the opinion that they spawn mainly at night. I operated in Indian river for a few days in November with net, but did not get any fish. I am satisfied that the mascalonge can be artificially propagated if the fish

can be captured. The best way, in my opinion, is to get a strong medium sized trap net made during the winter, and catch the fish in the spring or any time when they can be caught, and keep them at the hatchery in suitable ponds that do not freeze during the winter. I think this plan would be a certain success. I have just such water at this hatchery, and think this the only way that mascalonge can be had in spawning condition with any degree of certainty.

M. B. HILL,

Superintendent St. Lawrence Hatchery.

CLAYTON, JEFFERSON COUNTY, N. Y., *December* 1, 1887.

FINANCIAL REPORT

OF THE

COMMISSIONERS OF FISHERIES, IN PURSUANCE OF THE PROVISIONS OF CHAPTER 643 OF THE LAWS OF 1873.

The commissioners have received during the year ended November 30, 1887, of moneys appropriated under the general appropriation act of 1887, the sum of $25,653.69, which has been disbursed by them "for the purpose of replenishing the lakes, rivers and other waters of the State with fish," as provided by law, in the manner stated, in the following tables, viz.:

FOR THE MAINTENANCE OF THE HATCHING STATION AT CALEDONIA, AND OF SHAD HATCHING ON THE HUDSON RIVER.

ABSTRACT FOR DECEMBER, 1886.

Superintendence.		
Seth Green, superintendent, one months salary,	$250 00	
M. A. Green, assistant superintendent, one months salary	100 00	
		$350 00
Labor of Employés.		
James H. Marks, 31 days work, at $2 per day,	$62 00	
E. L. Marks, 31 days work, at $2 per day	62 00	
Jonathan Mason, 25 days work, at $2 per day	50 00	
E. F. Boehm, 19 days work, at $2 per day	38 00	
David Day, 31 days work, at $1.50 per day	46 50	
W. D. Oviatt, 31 days work, at $1.50 per day	46 50	
J. G. Roberts, 11 days work, at $1.50 per day	16 50	
B. Shaddock, 31 days work, at $1 per day	31 00	
		352 50
Cost of fish food	$80 19	
Expressage on same	18 00	
		98 19
Housekeeping		71 26
Traveling expenses		5 43
Stationery		8 32
Miscellaneous materials, etc.		123 96

St. Lawrence Hatchery.

M. B. Hill, superintendent, salary for October...	$62 00	
M. B. Hill, superintendent, salary for November,	60 00	
M. B. Hill, superintendent, disbursements for October.....	121 35	
M. B. Hill, superintendent, disbursements for November.....	125 80	
		$369 15

Fulton Chain Hatchery.

Jonathan Mason's disbursements	$41 89	
E. F. Boehm's disbursements	141 93	
		183 82
Total for month		$1,562 63

ABSTRACT FOR JANUARY, 1887.

Superintendence.

Seth Green, superintendent, one months salary,	$250 00	
M. A. Green, assistant superintendent, one months salary	100 00	
		$350 00

Labor of Employés.

J. Mason, 31 days work, at $2 per day.....	$62 00	
J. H. Marks, 31 days work at $2 per day.....	62 00	
E. L. Marks, 31 days work, at $2 per day.....	62 00	
David Day, 31 days work, at $1.50 per day.....	46 50	
W. D. Oviatt, 31 days work, at $1.50 per day...	46 50	
J. H. Roberts, 31 days work, at $1.50 per day..	46 50	
B. Shaddock, 31 days work, at $1.25 per day...	38 75	
		364 25
Cost of fish food.....	$68 10	
Expressage on same.....	14 30	
		82 40
Housekeeping		67 56
Traveling expenses.....		3 10
Stationery		6 55
Miscellaneous materials, etc...		31 08

St. Lawrence Hatchery.

M. B. Hill, superintendent, one months salary..	$62 00	
M. B. Hill, superintendent, disbursements.....	25 69	
M. A. Green's trip to St. Lawrence hatchery...	18 07	
		105 76

Fulton Chain Hatchery.

E. F. Boehm, superintendent, 31 days work, at $2.50 per day	$77 50	
E. F. Boehm, error in December account in salary	6 00	
E. F. Boehm's disbursements	23 20	
C. W. Colton, bill for materials	23 33	
		$130 03
Total for month		$1,140 73

ABSTRACT FOR FEBRUARY, 1887.

Superintendence.

Seth Green, superintendent, one months salary,	$250 00	
M. A. Green, assistant superintendent, one months salary	100 00	
		$350 00

Labor of Employés.

Jonathan Mason, 28 days work, at $2 per day	$56 00	
E. L. Marks, 28 days work, at $2 per day	56 00	
J. H. Marks, 24 days work, at $2 per day	48 00	
David Day, 28 days work, at $1.50 per day	42 00	
W. D. Oviatt, 28 days work, at $1.50 per day	42 00	
J. H. Roberts, 28 days work, at $1.50 per day	42 00	
Bruce Shaddock, 28 days work, at $1.25 per day,	35 00	
Frank Redband, 15 days work, at $1.50 per day,	22 50	
		343 50
Cost of fish food	$50 80	
Expressage on same	11 00	
		61 80
Housekeeping		64 23
Traveling expenses		21 52
Stationery		7 30
Miscellaneous materials, etc		54 89

St. Lawrence Hatchery.

M. B. Hill, superintendent, one months salary	56 00

Fulton Chain Hatchery.

E. F. Boehm, superintendent, 28 days work, at $2.50 per day	$70 00	
E. F. Boehm, disbursements	55 27	
		125 27
Total for month		$1,084 51

ABSTRACT FOR MARCH, 1887.

Superintendence.

Seth Green, superintendent, one months salary,	$250 00	
M. A. Green, assistant superintendent, one months salary	100 00	
		$350 00

Labor of Employés.

Jonathan Mason, 31 days work, at $2 per day	$62 00	
E. L. Marks, 31 days work, at $2 per day	62 00	
Frank Redband, 31 days work, at $1.50 per day,	46 50	
J. G. Roberts, 31 day work, at $1.50 per day	46 50	
David Day, 31 days work, at $1.50 per day	46 50	
W. D. Oviatt, 31 days work, at $1.50 per day	46 50	
Bruce Shaddock, 31 days work, at $1.25 per day,	38 75	
E. F. Boehm, 18 days work, at $2 per day	36 00	
		384 75
Cost of fish food	$51 22	
Expressage on same	12 50	
		63 72
Housekeeping		78 31
Traveling expense		5 30
Stationery		10 63
Miscellaneous materials, etc		72 07

St. Lawrence Hatchery.

M. B. Hill, superintendent, one months salary	$62 00	
M. B. Hill, superintendent, disbursements	19 00	
		81 00

Fulton Chain Hatchery.

E. F. Boehm, superintendent, 13 days work, at $2.50 per day	$32 50	
E. F. Boehm, disbursements	26 14	
H. D. Grant's bill for materials, etc	44 72	
		103 36
Total for month		$1,149 14

ABSTRACT FOR APRIL, 1887.

Superintendence.

Seth Green, superintendent, one months salary,	$250 00	
M. A. Green, assistant superintendent, one months salary	100 00	
		$350 00

Labor of Employés.

Jonathan Mason, 30 days work, at $2 per day...	$60 00	
E. L. Marks, 30 days work, at $2 per day.....	60 00	
E. F. Boehm, 30 days work, at $2 per day.....	60 00	
Frank Redband, 30 days work, at $2 per day...	60 00	
David Day, 30 days work, at $1.50 per day.....	45 00	
W. D. Oviatt, 30 days work, at $1.50 per day...	45 00	
Bruce Shaddock, 30 days work, at $1.50 per day,	37 50	
		$367 50
Cost of fish food.....	$61 73	
Expressage on same.....	11 00	
		72 73
Housekeeping.....		63 69
Traveling expenses.....		5 46
Stationery.....		4 25
Miscellaneous, including expenses of catching adult fish, $87.35		157 47

St. Lawrence Hatchery.

M. B. Hill, one months salary.....	$60 00	
M. B. Hill's disbursements.....	15 00	
		75 00
Total for month.....		$1,096 10

ABSTRACT FOR MAY, 1887.

Superintendence.

Seth Green, superintendent, one month's salary,	$250 00	
M. A. Green, assistant superintendent, one month's salary.....	100 00	
		$350 00

Labor of Employés.

Jonathan Mason, 31 days work, at $2 per day ..	$62 00	
E. F. Boehm, 31 days work, at $2 per day.....	62 00	
E. L. Marks, 31 days work, at $2 per day	62 00	
F. Redband, 31 days work, at $2 per day	62 00	
Bruce Shaddock, 31 days work, at $1.50 per day,	46 50	
David Day, 31 days work, at $1.50 per day.....	46 50	
W. D. Oviatt, 8 days work, at $1.50 per day....	12 00	
		353 00
Cost of fish food	$80 52	
Expressage on same.....	12 25	
		92 77

Housekeeping (including furniture and table ware)		$107 70
Traveling expense		7 67
Stationery		3 00
Miscellaneous, materials, etc., including expense of mascalonge hatching experiment, $27.69		68 48
St. Lawrence Hatchery.		
M. B. Hill, superintendent, one months salary	$62 00	
M. B. Hill's disbursements	101 14	
		163 14
Total for month		$1,145 76

ABSTRACT FOR JUNE, 1887.

Superintendence.

Seth Green, superintendent, one months salary,	$250 00	
M. A. Green, assistant superintendent, one months salary	100 00	
		$350 00
Labor of Employés.		
Jonathan Mason, 30 days work, at $2 per day	$60 00	
E. L. Marks, 30 days work, at $2 per day	60 00	
Frank Redband, 30 days work, at $2 per day	60 00	
Bruce Shaddock, 30 days work, at $1.50 per day,	45 00	
David Day, 30 days work, at $1.50 per day	45 00	
E. F. Boehm, 19 days work, at $2 per day	38 00	
		308 00
Cost of fish food	$92 62	
Expressage on same	13 25	
		105 87
Housekeeping		61 55
Traveling expense		14 53
Stationery		3 65
Miscellaneous materials, etc., $27.18, and expense of shad hatching, $519.95		547 13
St. Lawrence Hatchery.		
M. B. Hill, superintendent, one months salary	$60 00	
M. B. Hill's disbursements	20 50	
		80 50

Fulton Chain Hatchery.

E. F. Boehm, superintendent, 11 days work, at $2.50 per day	$27 50	
E. F. Boehm, disbursements	156 40	
		$183 90
Total for month		$1,655 13

ABSTRACT FOR JULY, 1887.

Superintendence.

Seth Green, superintendent, one months salary,	$250 00	
M. A. Green, assistant superintendent, one months salary	100 00	
		$350 00

Labor of Employés.

Jonathan Mason, 31 days work, at $2 per day	$62 00	
Frank Redband, 31 days work, at $2 per day	62 00	
E. L. Marks, 24 days work, at $2 per day	48 00	
David Day, 31 days work, at $1.50 per day	46 50	
Bruce Shaddock, 31 days work, at $1.50 per day,	46 50	
E. F. Boehm, 9 days work, at $2 per day	18 00	
		283 00
Cost of fish food	$82 82	
Expressage on same	12 25	
		95 07
Housekeeping		78 25
Traveling expenses		5 82
Stationery		2 00
Miscellaneous materials, etc., $67.28, and telephone from hatchery to depot, $26.25		93 53

St. Lawrence Hatchery.

M. B. Hill, superintendent, one months salary	62 00

Fulton Chain Hatchery.

E. F. Boehm, 22 days work, at $2.50 per day	$55 00	
E. F. Boehm, disbursements	165 46	
		220 46
Total for month		$1,190 14

ABSTRACT FOR AUGUST, 1887.

Superintendence.

Seth Green, superintendent, one months salary,	$250 00	
M. A. Green, assistant superintendent, one months salary	100 00	
		$350 00

Labor of Employés.

Frank Redband, 31 days work, at $2 per day	$62 00	
E. F. Boehm, 27 days work, at $2 per day	54 00	
E. L. Marks, 19 days work, at $2 per day	38 00	
Bruce Shaddock, 31 days work, at $1.50 per day,	46 50	
David Day, 31 days work, at $1.50 per day	46 50	
Benjamin Shaddock, 31 days work, at $1 per day,	31 00	
		278 00
Cost of fish food	$102 62	
Expressage on same	14 25	
		116 87
Housekeeping		64 17
Traveling expenses		6 56
Stationery		1 00
Miscellaneous: lumber, materials, etc		117 93

St. Lawrence Hatchery.

M. B. Hill, superintendent, one month's salary	62 00
Total for month	$996 53

ABSTRACT FOR SEPTEMBER, 1887.

Superintendence.

Seth Green, superintendent, one months salary,	$250 00	
M. A. Green, assistant superintendent, one months salary	100 00	
		$350 00

Labor of Employés.

Jonathan Mason, 30 days work, at $2 per day	$60 00	
Frank Redband, 30 days work, at $2 per day	60 00	
Bruce Shaddock, 30 days work, at $1.50 per day,	45 00	
Benjamin Shaddock, 30 days work, at $1.25 per day	37 50	
David Day, 30 days work, at $1.50 per day	45 00	
E. L. Marks, 9 days work, at $2 per day	18 00	
		265 50

Cost of fish food	$97 57	
Expressage on same	14 75	
		$112 32
Housekeeping		108 74
Traveling expense		3 70
Stationery		3 00
Miscellaneous materials, extra labor and including cost of ice-house, $171.64		434 56

St. Lawrence Hatchery.

M. B. Hill, superintendent, one months salary	$60 00	
M. B. Hill's disbursements	56 43	
		116 43

Fulton Chain Hatchery.

E. L. Marks, superintendent, 21 days work at $2.50	$52 50	
E. L. Marks, disbursements	52 71	
J. M. Warren & Co., 156 feet 2 inch of 3 inch iron pipe for hatchery	38 49	
		143 70
Total for month		$1,537 95

ABSTRACT FOR OCTOBER, 1887.

Superintendence.

Seth Green, superintendent, one months salary,	$250 00	
M. A. Green, assistant superintendent, one months salary	100 00	
		$350 00

Labor of Employés.

Jonathan Mason, 31 days work, at $2 per day	$62 00	
E. F. Boehm, 31 days work, at $2 per day	62 00	
Frank Redband, 31 days work, at $2 per day	62 00	
David Day, 31 days work, at $1.50 per day	46 50	
Bruce Shaddock, 31 days work, at $1.50 per day	46 50	
Benj. Shaddock, 31 days work, at $1.25 per day,	38 75	
Martin Brasser, one months salary	20 00	
		337 75
Cost of fish food	$88 22	
Expressage on same	12 75	
		100 97

Housekeeping		$79 29
Traveling expense		6 28
Stationrey		5 05
Miscellaneous materials, etc		26 55
Fulton Chain Hatchery.		
E. L. Marks, superintendent, 31 days work, at $2.50	$77 50	
E. L. Marks, disbursements	94 27	
		171 77
Total for month		$1,077 66

ABSTRACT FOR NOVEMBER, 1887.

Superintendence.		
Seth Green, superintendent, one months salary,	$250 00	
M. A. Green, assistant superintendent, one months salary	100 00	
		$350 00
Labor of Employés.		
Jonathan Mason, 30 days work, at $2 per day	$60 00	
Frank Redband, 30 days work, at $2 per day	60 00	
E. F. Boehm, 30 days work, at $2 per day	60 00	
Benjamin Shaddock, 30 days work, at $1.50 per day	45 00	
David Day, 30 days work, at $1.50 per day	45 00	
Bruce Shaddock, 30 days work, at $1.50 per day,	45 00	
Martin Brasser, one months salary	30 00	
		345 00
Cost of fish food	$79 80	
Expressage on same	12 10	
		91 10
Housekeeping		78 06
Traveling expense (including expense of gathering salmon-trout spawn)		276 52
Stationery		7 30
Miscellaneous materials, etc		66 09
St. Lawrence Hatchery.		
M. B. Hill, superintendent, salary for October	$80 00	
M. B. Hill, superintendent, salary for November	80 00	
M. B. Hill, disbursements for October and November	179 34	
		339 34

Fulton Chain Hatchery.

E. L. Marks, superintendent, 30 days work, at $2.50 per day	$75 00	
E. L. Marks, disbursements for November	128 60	
For 12 Chase hatching jars and royalty for one year	39 00	
Expressage on jars from Detroit, Mich	2 85	
		$245 45
Total for month		$1,799 66

EXPENSES AT CALEDONIA HATCHERY FROM DECEMBER 1, 1886, TO DECEMBER 1, 1887.

MONTHS.	Superintendence.	Pay of employés.	Fish food.	Housekeeping.	Traveling expenses.	Stationery.	Miscellaneous.	St. Lawrence hatchery.	Fulton Chain hatchery.	Total.
December	$350 00	$352 50	$98 19	$71 26	$5 43	$8 32	$123 96	$369 15	$183 82	$1,562 63
January	350 00	364 25	82 40	67 56	3 10	6 55	31 08	105 76	130 03	1,140 73
February	350 00	343 50	61 80	64 23	21 52	7 30	54 89	56 00	125 27	1,084 51
March	350 00	384 75	63 72	78 31	5 30	10 63	72 07	81 00	103 36	1,149 14
April	350 00	367 50	72 73	63 69	5 46	4 25	157 47	75 00	.....	1,096 10
May	350 00	353 00	92 77	107 70	7 67	3 00	68 48	163 14	.....	1,145 76
June	350 00	308 00	105 87	61 55	14 53	3 65	547 13	80 50	183 90	1,655 13
July	350 00	283 00	95 07	78 25	5 83	2 00	93 53	62 00	220 46	1,190 14
August	350 00	278 00	116 87	64 17	6 56	1 00	117 93	62 00	.....	996 53
September	350 00	265 50	112 32	108 74	3 70	3 00	434 56	116 43	143 70	1,537 95
October	350 00	337 75	100 97	79 29	6 28	5 05	26 55	.....	171 77	1,077 66
November	350 00	345 00	91 90	78 06	276 52	7 30	66 09	339 34	245 45	1,799 66
	$4,200 00	$3,982 75	$1,094 61	$922 81	$361 90	$62 05	$1,793 74	$1,510 32	$1,507 76	$15,435 94

COLD SPRING HARBOR.

ABSTRACT FOR DECEMBER, 1886.

Superintendence.

F. Mather, superintendent, one months salary		$125 00

Express Charges.

Long Island Express Company, wire cloth from New York	$0 55	
Long Island Express Company, fyke net from New York	25	
Long Island Express Company, hatching tin from Clayton, N. Y.	80	
Long Island Express Company, letter heads from New York	25	
		1 85

Lumber.

Wood & Carll, lumber for fence		161 36

Drain Tile.

Stewart & Co., drain tile for ponds		46 00

Labor on Grounds.

W. H. Walters, digging for drain tile	$3 38	
Geo. Brown, digging for drain tile	6 75	
Silas D. Wood, digging for drain tile	6 00	
F. A. Wheeler, digging for drain tile	4 50	
John Homan, digging for drain tile	4 12	
Chas. J. Dale, laying drain tile	9 00	
Shepard Keene, laying drain tile	6 75	
Warren Gardiner, grading grounds	12 75	
W. Hager, grading grounds	6 75	
Benj. Doty, Jr., grading grounds	6 00	
Peter Gorman, grading grounds	21 00	
Wm. Wade, horse and cart grading grounds	3 00	
Frank Bennett, filling trench	5 25	
		95 25

Labor in Hatchery.

C. H. Walters, 31 days labor, at $1.75	$54 25	
R. Fairchild, Jr., 12 days labor, at $1.25	15 00	
		69 25

Fish Food.

S. A. Walters, clams for fish		3 00

Miscellaneous.

W. H. Stoyle, stove and tin ware	$13 75	
Howard & Morse, wire-cloth	13 32	
American Net and Twine Company, fyke net	6 30	
Capt. James Wright, freight on drain tile	3 25	
John M. Davis, printing 1,000 letter-heads	5 50	
Telegram to Delamater & Co.	41	
Postage stamps for E. G. Blackford	50	
		$43 03
Total		$545 54

ABSTRACT FOR JANUARY, 1887.

Superintendence.

F. Mather, superintendent, one months salary		$125 00

Express Charges.

Long Island Express Company, box of Loch-Leven trout eggs from Scotland	$2 10	
Long Island Express Company, box of white-fish eggs from Michigan	7 50	
Long Island Express Company, box of frost-fish eggs from Lake Brandon	11 75	
		21 35

Fish Food.

S. A. Walters, mussels for fish		3 00

Miscellaneous.

C. H. Delamater & Co., repairs to engine	$14 80	
J. C. Totten, carriage to railroad for commissioner	4 00	
J. B. Simonson, tin outlet trough	6 00	
Telegram to E. G. Blackford	25	
J. J. Lavell, blacksmithing	3 75	
Edward Holmes, filing eight saws	1 60	
W. E. Jones & Hewlett, coal, cement and sundries	49 09	
Commissioner Blackford, contingent expenses	10 60	
Commissioner Blackford, postage stamps	50	
Commissioner Blackford, one aquarium and stand	8 00	
		98 59
Total		$247 94

ABSTRACT FOR FEBRUARY, 1887.

Superintendence.

F. Mather, superintendent, one months salary		$125 00

Express Charges.

Long Island Express Company, aquarium and stand from New York	$1 10	
Long Island Express Company, glass for aquaria	35	
Long Island Express Company, glass for aquaria	30	
Long Island Express Company, tools from New York	50	
Long Island Express Company, wire-cloth from New York	1 00	
Erie Express Company, box to Caledonia for eggs	1 25	
Erie Express Company, box from Caledonia, eggs for Europe	1 65	
Long Island Express Company, trout eggs from Caledonia	3 05	
Long Island Express Company, five cans of smelts from Brookhaven	75	
Long Island Express Company, garden roller from New York	53	
		10 48

Travel.

F. Mather, to New York and return, for glass and tools	$3 20	
C. H. Walters, to Brookhaven for smelts	6 00	
C. H. Walters, to Caledonia for trout eggs	26 39	
F. Mather, to Albany and return, for new hatchery	15 45	
		51 04

Fish.

C. H. Walters paid for 75 smelts, at 10 cents	7 50

Lumber.

Wood & Carll, lumber for fence	12 00

Coal.

Wood & Carll, coal for hatchery	6 75

Fish Food.

Louis Bennett, 20 bushels mussels, at 15 cents		$3 00

Labor on Grounds.

Peter Gorman, 6¾ days on grounds, at $1.50		9 37

Miscellaneous.

Mrs. J. H. Lockwood, sundries	$8 62	
Halbrook Brothers, glass for aquaria	7 70	
Howard & Morse, wire-cloth	19 67	
Telegram to Commissioner Sherman, and answer,	60	
Peter Henderson & Co., lawn tools	22 40	
Telegram to M. A. Green	39	
E. G. Blackford, cartage on eggs for Europe	1 00	
Telegram to E. G. Blackford, and answer	62	
A. F. Brombacher & Co., hardware	3 10	
Commissioner Blackford, telegram to M. A. Green	39	
Commissioner Blackford, telegram from M. A. Green	35	
Commissioner Blackford, postage stamps	50	
Commissioner Blackford, stenographer	5 28	
		70 62
Total		$295 76

ABSTRACT FOR MARCH, 1887.

Superintendence.

F. Mather, superintendent, one months salary	$125 00

Express Charges.

Long Island Express Company, trout eggs from New York	$0 25
Long Island Express Company, hardware from New York (in February)	25
Long Island Express Company, trout eggs to Commissioner Blackford	40
Long Island Express Company, 5 cans of smelts from Brookhaven	1 25
Long Island Express Company, land-locked salmon eggs from Maine	3 45

Long Island Express Company, sundries from New York	$0 25	
Long Island Express Company, grayling eggs from France	30	
Long Island Express Company, trout eggs from New Hampshire	1 40	
		$7 55
Travel.		
C. H. Walters to Brookhaven for smelts	$6 50	
O. V. Rogers, planting white-fish	15 72	
		22 22
Fish.		
C. H. Walters paid for 150 smelts at 10 cents		15 00
Lumber.		
Wood & Carll, lumber for repairs		37 09
Coal.		
Wood & Carll, coal for hatchery		6 75
Fish Food.		
Louis Bennett, 20 bush mussels at 15 cents		3 00
Labor on Grounds.		
Peter Gorman, labor on grounds	$29 25	
Wm. Wade, carting sand	22 50	
		51 75
Miscellaneous.		
Telegram from E. G. Blackford	$0 25	
F. W. Devoe, sundries	8 36	
Telegram to E. G. Blackford and answer	50	
Telegram to A. Mather	25	
Postage stamps from December first	10 00	
Mrs. J. H. Lockwood, sundries	8 94	
E. G. Blackford, stenography	5 46	
E. G. Blackford, postage stamps	50	
		34 62
Total		$302 62

ABSTRACT FOR APRIL, 1887.

Superintendence.

F. Mather, superintendent, one months salary		$125 00

Express Charges.

Long Island Express, brown-trout eggs from Europe	$0 40	
Long Island Express, box of envelopes from New York	25	
		65

Labor on Grounds.

C. J. Dole, sodding about ponds	$23 99	
Peter Gorman, sodding about ponds	31 87	
		55 86

Miscellaneous.

Isaac Adams, lead pipe and plumbing	$7 15	
W. F. Reilly & Co., custom house permit for eggs	2 00	
Telegram from Commisioner Blackford	25	
E. G. Blackford, cartage and ferriage on eggs from Hoboken	2 50	
J. M. Davis, printing 500 envelopes	2 00	
Telegram from Hon. Joseph Fitch	25	
Mrs. J. H. Lockwood, sundries	1 10	
Postage stamps	2 00	
E. G. Blackford, stenographic work	4 66	
		21 91
Total for month		$203 42

ABSTRACT FOR MAY, 1887.

Superintendence.

F. Mather, superintendent, one months salary		$125 00

Labor in Hatchery.

C. H. Walters, 4 days labor in hatchery, at $1.75		7 00

Express Charges.

Long Island Express Company, wire-cloth from New York	$0 40	
Long Island Express Company, cans and pails from New York	1 75	
		2 15

Traveling Expenses.

F. Mather, to Prospect park, Brooklyn	$2 90	
F. Mather, to Albany, N. Y	17 40	
Peter Gorman, to Smithtown with shad	9 00	
C. J. Dole, to Brookhaven with shad	8 40	
		$37 70

Labor on Grounds.

Peter Gorman, miscellaneous labor	$36 00	
C. J. Dole, grading	35 12	
Wm. Wade, 15¾ days with horse and cart, at $3,	47 25	
		118 37

Miscellaneous.

Postage stamps	$2 20	
Seven telegrams	1 82	
Howard & Morse, wire-cloth	4 73	
E. G. Blackford, cartage, ferriage, etc	10 86	
E. G. Blackford, telegrams	72	
E. G. Blackford, stenographic work	3 56	
		23 89
Total		$314 11

ABSTRACT FOR JUNE, 1887.

Superintendence.

F. Mather, superintendent, one months salary		$125 00

Labor in Hatchery.

O. V. Rogers, 30 days labor, at $1.50	$45 00	
C. H. Walters, 30 days labor, at $1.75	52 50	
		97 50

Express Charges.

Long Island Express Company, box of letter files from New York		25

Fish Food.

Louis Bennett, clams and mussels (two months)		31 50

Labor on Grounds.

Peter Gorman, labor on grounds	$36 37	
Chas. J. Dole, labor on grounds	30 74	
		67 11

Miscellaneous.

Brower Brothers, 3 letter files	$2 25	
Telegram to C. H. Walters	25	
Mrs. J. H. Lockwood, sundries	5 93	
Postage stamps	1 00	
		$9 43
Total for month		$330 79

ABSTRACT FOR JULY, 1887.

Superintendence.

F. Mather, superintendent, one months salary		$125 00

Labor in Hatchery.

C. H. Walters, 31 days labor, at $1.75 per day	$54 25	
O. V. Rogers, 31 days labor, at $1.50 per day	46 50	
		100 75

Express Charges.

Long Island Express Company, wire cloth from New York		40

Labor on Ponds.

Peter Gorman, 23¼ days, at $1.50	$34 87	
C. J. Dole, 6 days, at $1.50	9 00	
		43 87

Fish Food.

Louis Bennett, 10 bushels soft clams, at $1.50		15 00

Miscellaneous.

Howard & Morse, wire cloth	$7 35	
J. C. Totten, carriages for commissioners	8 00	
Mrs. J. H. Lockwood, sundries	1 70	
Postage stamps	1 00	
		18 05
Total for month		$303 07

ABSTRACT FOR AUGUST, 1887.

Superintendence.

F. Mather, superintendent, one months salary		$125 00

Labor in Hatchery.

C. H. Walters, 31 days, at $1.75	$54 25	
O. V. Rogers, 31 days, at $1.50	46 50	
		100 75

Express Charges

Long Island Express Company, box of reports from Brooklyn	$0 25	
Long Island Express Company, box of letter-heads and envelopes	25	
Long Island Express Company, crate of wire cloth	40	
		$0 90

Fish Food

Louis Bennett, 24 bushels mussels, at 15 cents	3 60

Labor on Grounds.

Peter Gorman, 20¾ days, at $1.50	31 12

Miscellaneous.

Wood & Carll, one ton of coal and cartage	$6 50	
J. M. Davis, printing	9 25	
Howard & Moose, wire cloth	23 60	
Postage stamps	2 00	
Notary public, affidavit	25	
		41 60
Total		$302 97

ABSTRACT FOR SEPTEMBER.

Superintendence.

F. Mather, superintendent, one months salary	$125 00

Labor in Hatchery.

C. H. Walters, 30 days, at $1.75	$52 50	
O. V. Rogers, 30 days, at $1.50	45 00	
		97 50

Fish Food.

Louis Bennett, 20 bushels mussels, at 15 cents	3 00

Labor on Grounds.

Peter Gorman, 23 days, at $1.50	34 50

Express Charges.

Long Island Express Company, money from New York to pay men	60

Miscellaneous.

Telegram to Commissioner Blackford	$0 45	
Leffers, Jarvis and Conklin, molding for hatching trays	12 83	
Mrs. J. H. Lockwood, sundries	4 52	
Postage stamps	1 50	
Notary public, affidavit	25	
		$19 55
Total		$280 15

ABSTRACT FOR OCTOBER, 1887.

Superintendence.

F. Mather, superintendent, one months salary	$125 00

Labor in Hatchery.

C. H. Walters, 31 days labor, at $2	$62 00	
O. V. Rogers, 31 days labor, at $1.75	54 25	
		116 25

Fish Food.

Louis Bennett, 15 bushels mussels, at 15 cents	2 25

Labor on Ponds.

Peter Gorman, 24 days, at $1.50	36 00

Miscellaneous.

P. S. Vaughn, stenography for Commissioner Blackford	$3 00	
E. G. Blackford, 4 telegrams	1 00	
P. S. Vaughn, stenography for Commissioner Blackford	5 70	
E. G. Blackford, sundries	1 60	
W. P. Velsor, kettle for cooking food	3 00	
Postage stamps	2 00	
Telegram to Commissioner Blackford	25	
Notary public, affidavit	25	
		16 80
Total		$296 30

ABSTRACT FOR NOVEMBER, 1887.

Superintendence.

F. Mather, superintendent, one months salary		$125 00

Traveling Expenses.

E. G. Blackford, to C. S. Harbor in October		2 90

Express Charges.

L. I. Ex. Co., box of stationery from New York,	$0 25	
L. I. Ex. Co., blocks and rope from New York	30	
		55

Lumber.

Lefferts, Jarvis & Conklin, lumber for repairs		9 34

Fish Food.

Louis Bennett, 5 bushels of mussels, at 15 cents a bush		75

Labor on Grounds.

J. C. Totten, carting sand	$78 13	
George A. Mason, 10¾ days labor at $1.50	15 37	
William Holmes, 10¾ days labor at $1.50	15 37	
Mathias Jones, 20½ days labor at $1.50	30 75	
Peter Gorman, 23¾ days labor at $1.50	35 62	
		175 24

Drain Tile.

The Wilson & Bailie Manuf. Co., drain tile		141 42

Miscellaneous.

E. G. Blackford, telegraphing	$1 80	
E. G. Blackford, printing by J. M. Davis	4 00	
Wilbur & Hastings, stationery	10 00	
L. I. R. R. Co., freight on drain tile from E. N. Y.	24 00	
Hugh Larkey & Co., blocks and rope	4 44	
J. C. Totten, carting drain tile	18 00	
W. J. Brophy, distributing carp	5 00	
Mrs. J. H. Lockwood, sundries	2 36	
Postage stamps	2 00	
Telegram	30	
		71 90
Total		$527 10

CLASSIFICATION.

MONTHS.	Salary of superintendent.	Labor in hatchery.	Labor on ponds.	Labor on grounds.	Food for fish.	Traveling expenses.	Spawning fish.	Lumber and coal.	Express charges.	Drain pipe.	Miscellaneous expenses.	Total.
December	$125 00	$69 25	.....	$95 25	$3 00	.....	.....	$161 36	$1 85	$46 80	$43 03	$545 54
January	125 00	.....	.....	.....	3 00	.....	.....	.....	21 35	.....	98 59	247 94
February	125 00	.....	.....	9 37	3 00	$51 04	$7 50	18 75	10 48	.....	70 62	295 76
March	125 00	.....	.....	51 75	3 00	22 22	15 00	43 84	7 55	.....	34 26	302 62
April	125 00	.....	.....	55 86	.....	.....	.....	.....	65	.....	21 91	203 42
May	125 00	7 00	.....	118 37	.....	37 70	.....	.....	2 15	.....	23 89	314 11
June	125 00	97 50	.....	67 11	31 50	.....	.....	.....	25	.....	9 43	330 79
July	125 00	100 75	.....	43 87	15 00	.....	.....	.....	40	.....	18 05	303 07
August	125 00	100 75	.....	31 12	3 60	.....	.....	.....	90	.....	41 60	302 97
September	125 00	97 50	.....	34 50	3 00	.....	.....	.....	60	.....	19 55	280 15
October	125 00	116 25	$36 00	.....	2 25	.....	.....	.....	.....	.....	16 80	296 30
November	125 00	.....	.....	175 24	75	2 90	.....	9 34	55	141 42	71 90	527 10
	$1,500 00	$589 00	$36 00	$682 44	$68 10	$113 86	$22 50	$233 29	$46 73	$188 22	$469 63	$3,949 77

ADIRONDACK HATCHERY.

Expenditures for Maintenance of Adirondack Fish Hatchery from December 1, 1886, to November 30, 1887, inclusive—one year.

DECEMBER.

163	F. Radbund, transportion of fish fry	$34 09	
164	F. Radbund, labor in November	45 00	
165	Henry Lux & Sons, provisions	41 66	
166	J. P. Reilly, postage stamps	4 00	
167	Habner Brothers, furniture	88 18	
168	J. W. Wood, labor	8 75	
169	Edwin Otis, labor	20 00	
170	W. J. Gillespie, provisions, $4.45; equipment, $4.20	8 65	
171	Joseph Otis, labor	27 50	
172	Mrs. M. F. Otis, labor	6 50	
173	F. Radband, labor	46 50	
174	M. F. Otis, $38.75; horse hire, $17	55 75	
175	F. A. Waters, salary, $75; contingent, $1.60,	76 60	
			$463 18

JANUARY AND FEBRUARY.

176	F. A. Waters, salary, $75; disbursements, freight, $20.65; miscellaneous, $2.64	$98 29	
177	Joseph Otis, labor	21 26	
178	Edwin Otis, labor	20 00	
179	Mrs. M. F. Otis, labor	6 50	
180	Mrs. M. F. Otis, labor	6 50	
181	J. W. Wood, labor	32 50	
182	Willard Boyce, transportation	8 00	
183	Willard Boyce, transportation	9 00	
184	M. F. Otis, labor, $38.75; horse hire, $15	53 75	
185	J. H. Farrington, house-keeping supplies	39 28	
186	H. Toun, bob-sleds	18 00	
187	Platto & O'Brien, transportation	13 03	
188	W. J. Gillispie, expressage, $33; housekeeping supplies, $1.75; miscellaneous, $3.95,	38 70	
189	M. F. Otis, labor, $35; horse hire, $7	42 00	
190	Geo. D. Knowles, provisions	34 88	
191	James Carle, freight	2 25	
192	Mrs. Millard Otis, labor	6 50	
193	Edwin Otis, labor	30 00	

194	Joseph Otis	$30 00	
195	F. A. Waters, one months salary	75 00	
196	F. A. Waters, labor	10 00	
197	S. W. Sherman, traul, $29.18; services, $15,	44 18	
			$639 62

MARCH.

198	White & Stickney, lumber for barn	$154 68	
199	Chisby & Barnard, housekeeping supplies	122 88	
200	R. H. McIntyre, tools, $34.70; stove and pipe, $49.18; other hardware, $21.04	104 92	
201	F. Radband, labor	36 00	
202	Jas. Hillarks, salary, $70; traul, $19.40; postage, 75c	90 15	
203	M. F. Otis, labor, $38.75; horse hire, $11	49 75	
204	Edwin Otis, labor	33 75	
205	Joseph Otis, labor	33 75	
206	Chisby & Barnard, groceries	23 20	
207	M. L. Baldwin, meals and horse keeping	8 00	
207	Anna Otis, household labor	6 50	
209	L. C. Childs & Son, printing	4 00	
210	J. B. Wells & Son, towels	3 00	
			670 58

ADIRONDACK HATCHERY.

Expenditures for maintenance of Adirondack Fish Hatchery, from April 1 to November 30, 1887, inclusive.

ABSTRACT FOR APRIL.

No. of voucher.	To whom paid.	For what purpose paid.	Amount.
211 ...	W. L. Baldwin.....	Hotel bill.....	$18 50
212 ...	W. J. Gilespie.....	Express on fish eggs	5 00
213 ...	W. L. Baldwin.....	Hotel bill.....	1 25
214 ...	M. F. Otis.....	Labor and horse hire.....	44 50
215 ...	M. F. Otis.....	Horse, harness and wagon..	165 00
216 ...	Mrs. M. F. Otis	Housekeeping	6 50
217 ...	Chesley & Barnard..	Groceries	9 40
218 ...	John G. Roberts....	Labor	4 50
219 ...	James H. Marks	Salary	75 00
220 ...	J. H. Ferrington....	Groceries	19 80
	Total amount....	.....	$349 45

ABSTRACT FOR MAY.

221 ...	John Warner.....	Drawing lumber.....	$8 00
222 ...	James H. Marks	Salary and expenses.....	76 00
223 ...	G. W. Knowles	Butter.....	5 00
224 ...	John G. Roberts....	Labor	46 50
225 ...	Mrs. J. H. Marks ...	Housekeeping	4 00
226 ...	M. F. Otis.....	Labor and 10 bush. potatoes,	7 50
227 ...	J. H. Ferrington....	Groceries	33 43
228 ...	Titus & Town	Paints and oils	3 05
229 ...	R. H. McIntyre.....	Hardware	5 34
230 ...	W. L. Baldwin.....	Hotel bill	1 50
231 ...	Wm. H. Chase.....	Labor on barn.....	22 00
232 ...	L. S. Green	Framing barn	20 00
233 ...	Chesley & Barnard..	Groceries	8 51
234 ...	Putnam & Ricketson,	Provisions	8 83
	Total amount....	.....	$249 66

ABSTRACT FOR JUNE.

235 ...	Putnam & Ricketson,	Provisions	$19 96
236 ...	J. H. Ferrington....	Groceries, paints and oils...	61 72
237 ...	J. H. Marks	Salary and postage stamps..	76 00
238 ...	J. G. Roberts.....	Labor	45 00
239 ...	Mrs. J. H. Marks....	Housekeeping	4 00
240 ...	Wm. H. Chase.....	Carpenter work.....	60 00
241 ...	M. F. Otis.....	Labor	37 50
	Total amount....	.....	$304 18

ABSTRACT FOR JULY.

No. of voucher.	To whom paid.	For what purpose paid.	Amount.
242 ...	Charles C. Bangs ...	Fire extinguishers	$20 00
243 ...	Burdick Furniture Co	Lumber	27 19
244 ...	R. H. McIntyre.....	Hardware.....	9 06
245 ...	Chesley & Barnard..	Groceries	14 23
246 ...	M. L. Baldwin.....	Hotel bill.....	4 25
247 ...	J. G. Roberts.....	Labor	46 50
248 ...	M. F. Otis	Labor	38 75
249 ...	Mrs. J. H. Marks....	Housekeeping	4 00
250 ...	James H. Marks	Salary and postage stamps..	76 00
251 ...	Wm. H. Chase.....	Carpenter work.....	40 00
252 ...	J. H. Ferrington....	Groceries	79 94
253 ...	Putnam & Ricketson,	Provisions	22 24
	Total amount....	.....	$382 16

ABSTRACT FOR AUGUST.

254 ...	New Hartford Canning Co.....	Canned goods	$25 35
255 ...	J. H. Ferrington....	Groceries and buckboard wagon	82 54
256 ...	M. L. Baldwin.....	Hotel bill.....	2 75
257 ...	N. B. Flanders.....	Blacksmithing.....	4 00
258 ...	Chesley & Barnard..	Groceries	21 49
259 ...	Titus & Town.....	Paints and oils	15 73
260 ...	William Simpson ...	Vegetables	6 65
261 ...	Wm. H. Chase.....	Carpenter work...	4 00
262 ...	John G. Roberts....	Labor	46 50
263 ...	Mrs. J. H. Marks....	Housekeeping	4 00
264 ...	James H. Marks	Salary	75 00
265 ...	Millard F. Otis	Labor	17 50
266 ...	Putnam & Ricketson,	Provisions	19 16
	Total amount....	.....	$324 67

ABSTRACT FOR SEPTEMBER.

267 ...	James H. Marks	Salary	$75 00
268 ...	Mrs. J. H. Marks...	Housekeeping	4 00
269 ...	N. B. Flanders.....	Blacksmithing.....	6 50
270 ...	Putnam & Ricketson,	Provisions	23 04
271 ...	Millard F. Otis	Labor	37 50
272 ...	M. L. Baldwin.....	Hotel bill.....	2 50
273 ...	Titus & Town	Printing and express.....	7 90
274 ...	Chesley & Barnard..	Groceries	7 50
275 ...	R. H. McIntyre.....	Hardware.....	7 30
276 ...	J. H. Ferrington....	Groceries	20 14

ABSTRACT FOR SEPTEMBER—(*Continued*).

No. of voucher.	To whom paid.	For what purpose paid.	Amount.
277 ...	John G. Roberts....	Labor	$45 00
278 ...	Adk. R. R. express.	Two boxes hand grenades ..	1 00
279 ...	Adk. R. R. express..	Three boxes canned goods..	1 21
280 ...	Adk. R. R. express..	Four boxes canned goods, barrel vinegar.....	3 17
	Total amount....	.....	$241 76

ABSTRACT FOR OCTOBER.

281 ...	D. W. Riddle.....	Lumber	$23 00
282 ...	R. H. McIntyre.....	Hardware.....	13 25
283 ...	Titus & Town	Housekeeping supplies.....	2 50
284 ...	J. H. Ferrington....	Groceries	44 68
285 ...	Rufus Knokes.....	Potatoes and hay	42 00
286 ...	Wm. H. Carter	Beef.....	12 35
287 ...	Mrs. J. H. Marks....	Housekeeping	4 00
288 ...	M. L. Baldwin.....	Hotel bill.....	2 25
289 ...	White & Stickney...	Lumber	5 00
290 ...	C. L. Bartlett	Hotel bill.....	21 00
291 ...	M. F. Otis.....	Labor	38 75
292 ...	Mrs. E. Otis.....	Milk bill.....	90
293 ...	Weston & Otis.....	Hotel bill.....	32 00
294 ...	J. H. Marks	Salary and hotel bill, $3	78 00
	Total amount....	.....	$319 68

ABSTRACT FOR NOVEMBER.

295 ...	J. H. Ferrington....	Housekeeping supplies, one lap robe	$25 36
296 ...	M. F. Otis.....	Labor	45 00
297 ...	Joseph Otis	Labor and chickens.....	57 50
298 ...	Mrs. J. H. Marks....	Housekeeping	4 00
299 ...	James H. Marks	Salary	75 00
300 ...	J. W. Wood.....	Labor	10 00
301 ...	Joseph Coolen.....	Beef.....	20 17
302 ...	Edwin Otis.....	Labor	48 75
303 ...	R. H. McIntyre.....	Hardware.....	23 95
304 ...	Titus & Town	Housekeeping supplies.....	3 70
305 ...	John Noakes	Straw	8 00
306 ...	Chesley & Barnard..	Housekeeping supplies.....	18 66
307 ...	J. G. Roberts.....	Labor	91 50
308 ...	J. G. Roberts.....	Expense of gathering lake trout spawn	153 98
309 ...	Ira Green.....	Hauling freight.....	4 00
	Total amount. ..	.....	$589 57

CLASSIFICATION.

MONTH.	Salary of superintendent.	Labor.	Subsistence.	Transportation travel and team hire.	Building materials and building.	Furniture.	Hatchery equipment.	Expenses spawn gathering at upper great lakes.	Miscellaneous and contingent.	Total.
1886.										
December	$75 00	$193 00	$46 11	$51 09	.....	$88 18	$4 20	.....	$5 60	$463,18
1887.										
January and February	150 00	252 01	75 91	137 11	.....	.....	18 00	.....	6 59	639 62
March	70 00	148 75	154 08	30 40	$175 72	52 18	34 70	.....	4 75	670 58
April	75 00	48 50	29 20	26 75	.....	.....	165 00	.....	5 00	349 45
May	75 00	53 00	60 77	9 50	50 39	.....	.....	.....	1 00	249 66
June	75 00	86 50	74 30	... .	67 38	.....	.....	.....	1 00	304 18
July	75 00	89 25	116 41	4 25	76 25	.....	20 00	.....	1 00	382 16
August	75 00	68 00	95 19	2 75	19 73	.....	60 00	.....	4 00	324 67
September	75 00	86 50	57 46	2 50	7 30	.....	1 00	.....	12 00	241 76
October	75 00	42 75	99 93	58 25	41 25	2 50	.....	.....	.....	319 68
November	75 00	253 00	23 92	.....	23 95	38 22	9 50	$153 98	12 00	589 57
	$895 00	$1,321 26	$833 28	$322 60	$461 97	$181 08	$312 40	$153 98	$52 94	$4,534 51

COLD SPRING HARBOR HATCHERY.

Disbursements, under the Act, Chapter 613, *Laws of* 1887, *to Provide for the Erection of a Fish Hatchery at Cold Spring Harbor.*

AS PER ABSTRACT A.

Number of vouchers.	Date.	To whom paid.	For what purpose paid.	Amount.
	1887.			
1..	July 20	F. E. Eberly.....	Architectural work..	$50 00
2..	Aug. 20	Oyster Bay Pilot....	Advertising	5 00
3..	Sept. 3	Long Islander.....	Advertising	2 00
4..	Sept. 5	South Side Signal...	Advertising	2 75
5..	Sept. 20	Suffolk Bulletin.....	Advertising	2 00
6..	Sept. 27	Fred Mather.....	Telegraphing	50
7..	Nov. 22	Talham Brothers....	Lead pipe.....	37 93
8..	Nov. 23	Long Island R. R. Co.	Freight charges ...	73
9..	Nov. 23	J. C. Totten	Cartage.....	75
		Total amount....	.....	$101 66
		AS PER ABSTRACT B.		
10..	Nov. 29	J. B. Lefferts.....	Erection of frame of hatchery buildings by contract	900 00
		Total amount....	.....	$1,001 66

LAKE PLEASANT HATCHERY.

Disbursements under the provisions of the Act, Chapter 293, *Laws of* 1887, *to Establish a Fish Hatchery at Mill Creek, Hamilton County.*

ABSTRACT A.

Number of vouchers.	Date.	To whom paid.	For what purpose paid.	Amount.
1..	Oct. 4	Seth Green.....	Iron pipe, $166.30; plans, $50; labor, $88; travel, etc...	$339 19
2..	Aug. 8	E. F. Boehm.....	Travel, etc.....	15 30
3..	Oct. 3	E. F. Boehm.....	Construction of dam, road repairs, labor, subsistence, team work, building materials, etc.....	508 82
		Total amount....	.....	$863 31

DEPARTMENT OF GAME AND FISH PROTECTION.

Expenses in the Department of the Commissioners of Fisheries for their Necessary Incidental Expenses in Executing their Duties under Chapter 317, *Laws of* 1883. (*Appropriation, page* 681, *Chapter* 491, *Laws of* 1883.)

DISBURSEMENTS AS PER ABSTRACT E.

Number of voucher.	Date.	To whom paid.	For what purpose paid.	Amount.
	1886.			
38..	Dec. 1	H. H. Thompson, Sec.	Printing and postage	$30 08
	1887.			
39..	April 1	H. H. Thompson, Sec.	Printing, stationary and expressage, postage.....	66 75
40..	Dec. 1	H. H. Thompson, Sec.	Printing synopsis, postage and game laws.....	62 88
	Total..	.....	....	$159 71

Amount remaining in hands of the commissioners as per last report	$330 09
Remaining in hands of commissioners now	173 38

CONTINGENT EXPENSES.

Abstract of Payments for Necessary Contingent Expenses of the Commissioners of Fisheries for October 1, 1886, *to November* 30, 1887, *inclusive.*

Number of voucher.	Date.	To whom paid.	For what purpose paid.	Amount.
	1886.			
9..	Dec. 1	H. H. Thompson....	Salary 3 months to Dec. 1, $200; expressage, etc., $2.87	$202 87
10..	Dec. 1	R. U. Sherman.....	Travel and other disbursements	38 23
	1887.			
11..	Mar. 1	H. H. Thompson....	Three months salary to March 1, $200; transp'tation, $1.85	201 85
12..	Mar. 1	J. W. Crawford	Type-writing	5 50
13 } 14 }	June 1	W. H. Bowman ...	Travel and other disbursements	89 12

Contingent Expenses — (Continued).

Number of voucher.	Date.	To whom paid.	For what purpose paid.	Amount.
	1887.			
15..	June 1	E. G. Blackford.....	Travel and other disbursements	$13 25
16..	June 1	R. B. Roosevelt.....	Travel and other disbursements	18 35
17..	June 1	R. U. Sherman.....	Travel and other disbursements	23 10
18..	June 1	H. H. Thompson....	Three months salary to June 1, $200; P. O. stamps, $15....	215 00
19..	Sept. 1	R. B. Roosevelt.....	Travel and other disbursements	98 55
20..	Sept. 1	E. G. Blackford.....	Travel and other disbursements	24 80
21..	Sept. 1	C. H. Clayton & Co..	Printing and stationery.....	9 38
22..	Sept. 1	H. H. Thompson....	Three months salary to Sept. 1, $200; P. O. stamps, $12; game laws, $25; travel, $5.25; express, etc., $3.60...	245 85
23..	Sept. 1	W. H. Bowman.....	Travel and disbursements	88 16
24..	Sept. 1	Seth Green.....	Travel and disbursements	39 81
25..	Sept. 1	R. U. Sherman.....	Travel and disbursements	68 31
26..	Dec. 1	W. H. Bowman	Travel and disbursements	91 74
27..	Dec. 1	R. U. Sherman.....	Travel and disbursements	41 25
28..	Dec. 1	H. H. Thompson....	Three months salary to Dec. 1, $200; stamps, $17; express, $1.35.....	218 35
	Total..	.....	.....	$1,733 47

RECAPITULATION.

Receipts.

From annual appropriation bill, 1887	$25,653 69
From appropriation, chapter 613, Laws 1887, to provide for the erection of a fish hatchery at Cold Spring Harbor, Suffolk county	1,001 66
From appropriation, chapter 293, Laws 1887, to establish a fish hatchery at Milk creek, Hamilton county	863 31
From appropriation, chapter 491, Laws 1883, for incidental expenses of commissioners in department of game and fish protection — unexpended balance	333 09
	$27,851 75

Expenditures.

Expenditures for maintenance of Caledonia hatchery	$15,435 94
Expenditures for maintenance of Cold Spring Harbor hatchery	3,949 77
Expenditures for maintenance of Adirondack hatchery	4,534 51
Expenditures for construction of hatchery at Cold Spring Harbor	1,001 66
Expenditures for construction of hatchery at Mill creek	863 31
Expenditures for necessary contingent expenses of the commissioners, from December 1, 1886, to December 1, 1887	1,733 47
Expenditures of the commissioners for necessary incidental expenses in executing their duties under chapter 317, Laws of 1883	159 71
Unexpended balance of appropriation, chapter 491, Laws of 1883	173 38
	$27,851 75

The commissioners further report that there are no debts or liabilities outstanding against the commissioners.

All of which is respectfully submitted.

By order of the Board of Commissioners.

H. H. THOMPSON,
Secretary.

REPORTS OF GAME AND FISH PROTECTORS.

GEORGE W. WHITAKER — First District.

To the Commisssioners of Fisheries:

I respectfully submit, pursuant to your order, a summary of my official operations, in the first protection district, comprising the counties of Suffolk, Kings, Queens and Richmond, during the twelve months ended November 30, 1887.

December, 1886. — To Shinnecock and Peconic bays to examine shores for nets and to detect sailing for ducks. The ice covered the bays and persons were on the ice spearing for eels at Cold Spring. To Brooklyn and New York making inquiries with reference to the hunting of deer and as to the venison going into the Brooklyn and New York markets. Attended on the secretary of the South Side Club to request him to let their superintendent purchase some partridges supposed to be trapped, and making inquiries as to the fishing interest. Received telegram to go to Oakdale to examine evidence as to deer hunting in that locality and returned. Telegram to be met next morning at station. To Oakdale, and thence by the courtesy of the South Side Club, their keeper and horse conveyed me to Lakeland. Examined parties as to killing or chasing deer; the examination resulted in no evidence. All that could be obtained was that two men were out hunting, as they said, for foxes, but no doubt for deer, from the fact that one of the men shot and nearly killed the other with buckshot by mistake, seeing the bushes move. The party represented that I could do nothing as no deer was killed. I referred him to the general law where chasing deer is sufficient. With reference to shooting ducks at night I have to see the bird killed or in possession. Of course, parties in my presence will not kill a bird, neither will they admit having a bird in possession, so that as I have no power of search, I can not prosecute until the law is changed so that parties being on the bank of the river or of a stream or bay with guns in their possession may be taken as sufficient evidence to convict.

January, 1887.—Having received notice that partridges were exposed for sale in Brooklyn, went there to examine the stores late in the afternoon and I detected birds exposed for sale.

The next morning I again examined Fulton street, Myrtle avenue and a number of by-streets so as to be ready Saturday morning. I thought it best to secure some evidence besides my own. I therefore traveled to the different stores to see if the birds were still there. There were birds in nearly all the same stores. I then attended on the district attorney and requested him to give me a man to go with me. He advised my going to the sheriff's office, and upon inquiry there of the deputy sheriff, there was only one person who could aid me and he did not belong to the office. He asked me how much money there was in it, and when I told him he would get fees for being a witness, he said that I had better look for some one else. I then endeavored to get a private detective but could not. I then went to New York and procured the person who gave me notice of the violation. Examined five stores, took down the evidence in each case, had my witness sign it as well as myself, and then returned to Southampton. Wrote district attorney with names and evidence to prosecute and to advise me when he would be ready. After waiting several days and hearing nothing from the district attorney, went to Brooklyn. I could not see him as he was before the grand jury on a murder case. Made an appointment to see him the next morning, when he wished me to go out and enter complaint before the police justice and he would attend to it by my giving him notice. Entered complaint against five parties and gave district attorney notice. Attended court; four pleaded guilty, one not guilty; decision reserved until February three. Entered a complaint against another party, which case was also fixed for February three. I met no opposition from the dealers, but the greatest civility.

February.—To Brooklyn to attend police justice's court. Frederick Graff, Peter Neibles, D. A. Morrison, and Jantzer were fined five dollars each for exposing partridges for sale out of season. The defendant Koechel pleaded guilty and was also fined five dollars. John H. Gehr, another defendant who was subsequently found exposing birds for sale, when called, pleaded guilty and was fined five dollars. Examined the stores in Brooklyn and depots. Drew up particulars for game committee as to game laws and report for Legislature and made inquiry as to the drainage into the bays from the hotels of Brighton Beach.

March.—Examined the sewers, etc., emptying into the bays. Received Assembly bill No. 594 from Assemblyman Reeves, with request to examine it. Examined it, and made amendments and additions, and returned it to Mr. Reeves, who acknowledged its receipt, and expressed the intention of putting it before the game committee. Subsequently

received another new bill from Mr. Reeves. Made alterations and returned it. Being in New York on my own business, made inquiries without charge to the State. Visited several places for trout, but could find none. Also attended parties to engage their assistance in obtaining an extra appropriation for the completing of Shinnecock canal, which will make those waters one of the finest fishing grounds in the State. Examined the markets and the depots for trout.

April.— Making inquiries as to who were appointed game constables, the proper returns not having been made to the county clerk. Having been informed that woodcock were being killed in close season; making inquiries as to same, but getting no evidence. Examining and making inquiries as to the fishing in the bays surrounding Sag Harbor. Having received information that trout were being sold in Brooklyn, went there and examined freight cars, depots, etc., for trout, but could not obtain sufficient evidence to convict.

May.— Went to the inlet at Meacox bay, where the fishing (if any) would be going on, and the shooting of snipe and other birds, but could find no evidence of infringment of the laws. Examined cars and depots in different places for snipe. Called on Mr. Wagstaff in New York, by appointment, and consulted with him. To Long Island City to examine witness as to shooting snipe. The witness had removed into the country from there. Examined Long Island depot and cars, and also examined several stores in different streets in Brooklyn. From New York to South Oyster bay, where I called on Mr. Dickinson, a name given to me as a witness, who was away from home; saw his brother, who said he did not believe his brother knew the fact, but had written from hearsay. Called upon two other persons whose names were furnished me by Mr. Wagstaff; they knew nothing, at least they said so. Returned to Southampton, when I received letters with reference to black bass fishing; writing parties explaining law as to time of commencing fishing, posting notices as to date in post-office.

June.— Went to Bridghamton, it being represented to me that several parties disobeyed the woodcock law, and that it was the custom in this neighborhood to shoot woodcock in July, and that they intended to do so this year. To Sag Harbor to see as to the netting of fish in the harbor; also to ascertain if the parties there were likely, as represented, to evade the woodcock law and shoot before the commencement of the season. I found it stated that parties were determined to do so. To Canoe Place, where it was thought several parties were shooting snipe, but found no evidence of

the fact. Was again informed by several persons that there were parties in Southampton village, Bridghampton, Hay Ground, Noyac and Sag Harbor who were about to violate the woodcock law, which had been more or less observed since I employed (at an expense of twenty-two dollars out of my own pocket) a detective to go to Sag Harbor and Bridghampton and board there, which he did, and though he obtained no evidence to justify a prosecution, yet by prevention for years it had the desired effect. Amending several copies of the game law synopsis to agree with the laws of 1887, and posting same and mailing to various parties. Attending on game constable at Southampton, pointing out to him his duty and advising him of parties in his neighborhood who had declared they would shoot woodcock on the first of July and during the month, and also explaining to him about the snipe shooting and sending him a synopsis of the law.

July.— It being represented that certain parties would insist upon shooting woodcock this month, and, having given the game constable notice in June of the fact, went to Sebonac, where the said parties had hired the right to shoot, but found no shooting being done. Rode in the woods over the woodcock ground for two days in succession, having also arranged in the village for notice of any violation to be given me. I afterwards found, upon inquiry, that the parties did not go out. Went on Sunday to Hay Ground, Stagg and Bridghampton to confer with parties in reference to persons shooting in those localities. I found that it was suspected that two parties (to whom I had given notice, with game law synopsis inclosed) had been shooting, and, although the parties were anxious to give me information, I could get no more than that they knew parties had gone out, and this by report. I had notice that many parties would this year go out upon the pretense that it was their custom, and that the birds would be gone in August; and consequently, as I am right in the midst of the woodcock ground, I have every day been on the alert to go myself. In years gone by I have in most cases sent a man on horseback, upon hearing the report of the gun. This year (he had not detected anyone) I have gone as game protector. The weather had been so exceedingly hot and wet that no shooting of any consequence has been going on. I heard at Hay Ground that a person had been shooting in the swamp, but parties did not know at what. Upon inquiry I ascertained that it was too hot, also that nets were not being used, as it would rot them. Examined Meacox bay and inlet where I was informed nets of undersize were being set. Fish were dying in great numbers from the closing of the inlet. The walking and riding ofter the parties, and

making my appearance, was more for the purpose of preventing the shooting, than, under the law as it now stands, of prosecuting, which is well nigh impossible. No call or notice of any kind received this month except as to the woodcock shooting in and near this neighborhood. The months of September and October are important months in the year and as the money for expenses is too small for much work in each year it is deemed by this protector that the State can be served better by greater exertion in these months.

August.— Went to Hay Ground, looking up evidence against persons shooting woodcock in the swamps there. As stated last month, a gentlemen was seen shooting, but no evidence could be had to convict as the law now stands. Went to Brooklyn to examine depots for any kind of game except woodcock, but could not find any. Examined several of the stores in Brooklyn and the depot in James' Slip and also went to Williamsburgh or East Brooklyn. I could find no evidence of the infringement of the law. Hearing there was a net at Eastport used with quite a small mesh, I went there, but the net had been removed. Guns continually being heard in the neighborhood, for several days watched for persons supposed, from the continued reports, to be shooting partridges and quail, but no evidence of the fact could be obtained after several attempts. I made my appearance in order to prevent further violations of the law. I have previously suggested that a law can be passed that will give the protector the necessary power to entirely stop this system of hunting. Believing that there were parties shooting in the woods on Sunday and would be liable to arrest, looked out for them. Persons were represented as shooting game on Shinnecock Hills, and saw a man, supposed to be Drake, who was hunting near a swamp, no doubt for quail, but after a long watching, he having seen me, nothing in the shape of evidence could be procured. To Noyac, looking for parties drawing seins; also to see if as formerly represented, that parties from Brooklyn were shooting partridges, quail and robins. I could not hear or see of any violations of the law. Amending and posting several copies of the synopsis.

September.— To Patchogue, examining shores and nets and called on Bradford & Sons, the principal fishermen in the neighborhood, and who formerly had informed me pounds were illegally set in Great South Bay. The son stated that the weather had been so bad that the fishing had been bad, and that no pounds had been set in the bays. He stated that in Islip town, on the line adjoining, there were several pounds, and that representations were being made to Commissioner Blackford in order to have these violations stopped. Went

from Patchogue to New York and Brooklyn, and called on the secretary for forms and any other information he might have to give me; returned to Southampton, and examined on the route Hunter's Point and James' Slip depots, and stores in Fulton market, where many of the Long Island birds are sent. Having received a letter from Mr. Monks, stating birds were being slaughtered in his locality and asking me to deputize him, replied to him that I had no power to deputize him, but if he would send me the evidence that I would prosecute the parties, and that I would very shortly visit his locality. Mr. Goodale called upon me to draw my attention to the sailing for ducks, when it was agreed I should see him later when parties would be shooting and sailing in October. Journey to Brooklyn and New York; had an interview with Mr. Monks with reference to the killing of game at his property, near Easthampton, and that locality, but I found he had no evidence to convict the parties, and made appointment to meet him the following week at the same time. I examined places in Brooklyn to see if birds and game out of season were being sold or exposed for sale, and returned to Southampton. To Canoe Place, where could hear of no netting or shooting of ducks; in fact, there were no ducks in the bay; heard of parties hunting with dogs; the parties evidently had been shooting quail, as the birds being scattered called for their mates, which is a pretty sure sign they had been disturbed, but I could get no evidence. Visited shores on bays for fishermen or their nets to find nets of meshes below the legal size.

October.— In response to a call to Longwood North-west, went there and remained Saturday and Sunday nights, being entertained by Mr. Monks, the owner of property there. From there on Sunday to Three-mile Harbor, to watch and catch Sunday shooters, but did not see any one with a gun, nor hear a gun fired all that day. On the Monday, there being no possible chance of catching parties, returned to Sag Harbor, talked with several persons; there appeared no doubt about parties shooting, but no one that I could see or hear from who would give any evidence against any one; finding it utterly impossible to detect the parties, I thought it best to try and prevent further violations by letting them understand I was looking after them, and in addition to making my appearance, and making enquiries that should come to their ears, I requested the editor of the *Corrector* to insert a notice in his next issue, which he agreed to do.

Mr. Goodale called upon me by appointment, and we had a long consultation, and it was agreed he should furnish me with evidence if he could get any, both as to fishing and shooting, and it was further agreed I should write to Messrs. Benedict, Corwith and Osborn,

inclosing copies of the game law synopsis, which may prevent further trouble. Being told that nets were set in the creek at West Neck, I went there and examined the waters and shores, when I found such nets if set had been removed. Ascertaining that a very large quantity of small blue and other fish were being caught in Shinnecock bay, of small size, some of less than a quarter of a pound, and sent to New York market, it being sure that small mesh nets were being used, went to Southampton to find out from parties the facts in the case, but could make no discovery. This being an important matter, I will use every effort to discover and seize the nets. The inlet is closed up and the fish can not escape to a warmer climate, and although the weather will probably kill nearly all these fish, the inlet can not be opened before February, and there can be no fresh water from the canal to protect hundreds of thousands of dollars worth of fish which will probably be lost, as the clams have already died, yet it is necessary to get rid of the nets with small meshes. I will give the seizure of them my closest attention. I received information that William Connor was carrying a gun in the Turnpike road on Sunday, and supposed to be after quail. I will look up the evidence, and endeavor to prosecute, even if beaten in the suit, so that it may look dangerous to others, and deter parties from shooting on Sundays. Letters to Messrs. Coswith, P. M., Benedict and Osborn, with synopsis of game laws, requesting them to post the same, and give me notice of anyone sailing ducks in the pond and Meacox bay, as complaints were being made to me. Writing Mr. Schellhass in reply to his letter stating persons were shooting at Flatlands and other places, especially on Sunday, that I would at an early date see him. Persons heard shooting in the wood. It seemed evident from the nature of the place and the shooting, they were after quail and partridge, and not woodcock. Following them up as long as there seemed a chance of catching them, could see nothing. Afterwards, they represented that they killed three woodcock. To Shinnecock Point with man, to examine nets in Shinnecock bay. Out in the bay and examined set net there. The mesh being three inches, it being evident this could not be the net in which small fish were being taken. Examined the shores; could see no one fishing, or any net on shore. To Greenport to look into and make inquiries as to the fishing there, and called upon Assemblyman Reeves, who was much engaged, when I left, promising to see him again, and made many other inquiries as to the fishing in that locality. Heard of many pounds in which it was claimed "Menhaden" were taken. From Greenport to Brooklyn. Took a seat next to

freight and express, so that I could see if any game were shipped at the different depots. Saw no game, nor any box likely to contain any. Called upon Mr. Schellhass in accordance with my letter to him, when I found he on Sundays took a walk with his beagles, and in his rambles came across some persons here and there as he supposed, shooting small birds, and boys with pistols. He stated that there were rabbits there, and that a gentleman had turned out quail, and none could now be found, which was more than likely, as a person of any judgment would not expect to find quail in a thickly settled country. He was desirous of putting a stop to persons shooting, and not arresting parties, as they were not of that class of persons who went out to kill game. It appeared to me that if I went out there I had better be alone than with a gentleman with a number of beagles (on Sunday) that would assuredly run rabbits if they struck a track. Made an appointment to see him next day in New York. Called on secretary of Rod and Gun Club who, upon my request, agreed to go with me in the afternoon, if I would come back, to Prospect Park and to Coney Island depot, thence to Van Sicklen station, where he had a boat for fishing, and would take me through the Coney Island creek to Gravesend bay. After going through the creeks into the bay we saw no nets set or on the shores, and afterwards heard I had been recommended by a fisherman to call me to another locality, stating no nets, since I seized some three years ago, had been set in the creeks, and the fishing had been very good. Returned to the hotel and as I had an engagement to go to Longwood on the game business. On Sunday wrote Mr. Schellhass that I had been over the country named by him and had seen no infringement of the law; that if he wanted me I would come up at any time, and that I had written to the game constable who lives near by, whom I subsequently heard from, to call upon him, that it was his duty to attend to the matter. I also wrote the captain of the park police to caution him to look after parties shooting Sundays. I did not attach much importance to this matter, as Mr. Schellhass had seen both Commissioner Blackford and Secretary Thompson, who had not notified me. I told Mr. Schellhass I had no alternative, if I saw a man breaking the game law, I should arrest him. With reference to the sewers to take away the refuse from the hotels at Coney Island they are fourteen miles in length. I did not ascertain, positively, whether the drainage emptied itself into a building for manufacturing manure, or emptied itself into the ocean. This I have hereafter to test. Called upon Mr. Monks and made an appointment to meet him the next day (Sunday) at Longwood.

Examined Fulton market and found no signs of a song or game bird, and also examined James' Slip, Long Island depot, but could see nothing; to municipal building to ascertain if captain of the park police had received my letter. Rode to Longwood and avoided going through Sag Harbor so that my presence should not be suspected. Heard some shooting, this being Sunday the party under any circumstances would be liable to arrest going round the wood to get to where I heard the report, but could see no one or hear anything more. On the road to Longwood I met two persons in a wagon I had gone through the woods to avoid, so that they might not know of my presence; they had nothing in the wagon I could see in the shape of inplements for the purpose of shooting game. I found on arrival at Mr. Monk's that my former visit and the insertion of the article in the paper had entirely prevented the shooting; that no parties had been seen and no guns heard, which previously was of daily occurrence. Examined a pound between North-west and Promised Land, and found the mesh two and one-eighth inches; the net undoubtedly is set to catch blue and other good fish as well as menhaden. The provision that the two and one-half inches prohibition shall not apply to nets used in taking menhaden seems to me will cause a defeat to any suit brought of this nature. On the road of my return back I stopped at Sag Harbor and attended on several parties there who gave me the names of two parties who set partridge hedges, thence to Southampton. To the village of Southampton, to see a gentleman who promised me he would if possible find out the time of drawing seines in Shinnecock bay. I had before found out the names of the owners of the nets. I ascertained the parties had sold out; I could not then find out to whom. Hearing persons were shooting at Canoe Place, went over there; I was informed that three parties had been shooting, and it was stated that no doubt at partridge and quail; that the birds had been divided and heard calling, a sure sign they had been disturbed, but I could find no one that could give me the evidence to convict. This is another case in which it will be seen persons shooting out of season, with a dog and gun, should be *prima facie* evidence of their guilt. To Shinnecock Point, on the Reservation, in the rain, and on the bay, examining nets, the set nets found being full size, nearly three-inch meshes. Seines evidently have been used, and probably are now, as small fish are caught. Called on district attorney as to the pounds before named, when I promised to send him particulars after the election, when he could judge if he would proceed against the parties. Examined depots along the road to Brooklyn.

I could see no birds shipped. Examined Fulton market also James Slip freight depot. I could see nothing that would indicate any violation of the laws. Called on Mr. Monks who was not in, and also called upon Mr. Schellhass, who was not in, making inquiry as to the nets used on Staten Island. I found the meshes are above the legal size of two inches. Persons shooting in some parts out of season, it seemed likely the game would come to Fulton market over the Long Island railroads. Examined Fulton market, James' Slip depot, from thence to Brooklyn and through the principal streets examining stores for game and small birds, thence to Prospect park and the neighborhood beyond to see if shooters could be found as represented by Mr. Schellhass. The next day being Saturday, and as the marketmen purchased game and stores from Washington market, I examined on my return home many of the principal stores and called on Mr. Blackford who was away to Southampton. On reaching Southampton on Saturday night I found a letter from Sag Harbor waiting me, stating parties at Noyac had been shooting before the season. Went to Sag Harbor and ascertained the names of parties who could supply me with the evidence. On Monday to Noyac, saw a Mr. Hallock who informed me six parties had come from Bridghampton and shot all day, and that Pierson had seen a bird killed. Examined Pierson and others. Pierson said he saw a bird fly across the road; a person shoot at and kill it; it fell in the road and the dog brought it to the parties, but he could not tell what bird it was. Most of the parties were from New York and Hartford. He promised that he would try and look up the evidence, and I am to see him again.

November.— To Noyac examining witness in a case of shooting before the season. Parties from New York and Hartford, Conn., came to a hotel at Bridghampton, Suffolk county, where they were joined by another person. A stage took them to Noyac with the necessary implements for shooting. They were seen to shoot two or three quail, but which of the party shot them is not yet determined. several witnesses have yet to be seen to work up the case in order to convict. To Shinnecock Point to look after seine on the shore. Measured set net in the bay and found the meshes were of legal size. To the village to make further inquiries as to nets evidently in use catching small fish. Being at the village I heard a party trying to sell a load of fish and from what I could understand the fish, some of them, were of small size. These fish must have been caught in Shinnecock bay, and a small mesh must have been used. The person was trying to sell these fish for, as I suppose, manure. This matter has to

be followed up until parties can be detected, and their nets seized. To Sag Harbor to see justice with reference to a warrant against a person seen carrying a gun in the highway on Tuesday. Examined parties there as to the snaring of patridges and the trapping of quail. Made enquiries for Christian names of Bennett Brothers using a pound size of mesh two and one-eighth inches. In this pound they catch menhaden and, also, good fish, and as the law permits nets to be set of that size mesh, for menhaden, it is doubtful as to conviction. Notice has been given me that many ducks were being netted. Upon examination I am led to believe the nets are so contrived as not to touch the bottom, in which case, it seems to me, the intent is shown that they are set to catch ducks. To Shinnecock bay and along the shore found seine of the following size : 170 yards in length the wings consisted of about seventy yards each of two and one-fourth inch mesh, ten yards of fourteen inch mesh adjoined to the wings on each side and in the middle, forming a bag of six to ten yards of three-fourths inch, joined to the fourteen inch mesh, which latter formed a bag and would take very small fish. I burned the nets up in accordance with the directions of the law, section 2, chap. 317, Laws of 1883. To Canoe Place to find out further as to the catching ducks ; so many people there could procure no evidence ; made an appointment to go there again. To Sag Harbor with witness ; procured warrant against Connor and convicted him, when he was fined five dollars. To Noyac to look up evidence against the New York parties shooting before the season; the evidence hard to obtain; but sufficient can be had to sue them, and probably to convict.

J. H. GODWIN, JR.— SECOND DISTRICT.

To the Commissioners of Fisheries:

As requested by you, I herewith submit my report for the twelve months ended November 30, 1887. During that time I have spent one hundred and thirty days and parts of days attending to the duties of my position and expended $112.75. I have placed in the office of the district attorney of New York county during this time thirty-six cases for prosecution, the penalties of which amounted to $6,400. Fifteen cases have been settled by the district attorney, and the amount of fines collected by him and paid to the city chamberlain is $487.50. The amount of costs and expenses which he has received has been

much more, as a number of the cases he settled by costs and expenses only, which amounts he is entitled to keep. I have had four persons, residents of Orange and Rockland counties, fined $65 for having snared game in possession.

Very respectfully.

JOSEPH H. GODWIN, JR.,
Game and Fish Protector, Second District.

KINGS BRIDGE, N. Y., *December* 1, 1887.

MATTHEW KENNEDY—THIRD DISTRICT.

To M. H. THOMPSON, *Secretry Board of Fish Commissioners:*

SIR.—I herewith submit a summary report of my official operations from December 1, 1886, to December 1, 1887, as follows :

MONTHS, 1886, 1887.	Number of men prosecuted.	Number convicted.	Number of suits pending.	Suits discontinued.	Suits determined.	Suits commenced in justice's courts.	Miles traveled.	Disbursements for travel.	Number of days in actual service.	Amount of fines and penalties imposed.	Remarks.
December.	....	....	....	....	....	....	337	$14 25	4	....	
January...	....	....	....	....	....	....	389	17 17	7	....	
February..	....	....	....	....	....	....	249	12 08	4	....	
March	5	2	1	....	1	2	470	25 35	9	$10	And costs.
April	7	4	2	....	1	3	519	23 74	7	25	Costs inclusive.
May	....	....	....	....	....	....	84	2 24	3	....	
June.....	....	....	....	....	....	....	271	7 40	10	....	
July	2	1	1	....	1	2	189	27 80	9	38	Violator impris'd.
August....	2	1	1	....	1	1	517	18 60	7	25	Costs inclusive.
September.	5	3	1	1	2	2	224	14 54	9	68	Costs inclusive.
October ...	2	1	....	....	1	1	284	20 50	8	25	Costs inclusive.
November.	....	....	....	....	....	....	402	15 09	6	....	
Totals..	23	12	6	1	7	11	3,935	$198 76	83	$191	

REMARKS.

During December, 1886, visited Poughkeepsie on complaint of the attorney of the game and fish association of Dutchess county, charging parties with having violated the law by hunting rabbits with ferret. Evidence insufficient to prosecute.

January.—On the fifteenth visited Sing Sing to consult party who had sent complaint alleging violations at Verplank's Point and vicinity by taking underweight striped bass.

March 3.—Appeared before Justice Burdett Turpin, of Port Ewen, and prosecuted parties charged with the taking of black bass out of Esopus lake out of season. Parties pleaded guilty and were fined.

March 10.— Visited Ancram to investigate complaint against parties alleged to have been netting trout. Parties were brought before justice. Evidence insufficient to convict.

April 19.— At New York city to consult Commissioner Blackford in relation to change of law concerning pond net-fishing in Hudson river and Sunday shad fishing in same river.

April 23.— At Red Hook and seized three nets in Swamp creek.

April 26.— At Castleton, on complaint of W. W. Byington, Secretary Eastern New York Game and Fish Protective Association, alleging illegal fishing with nets in Stony Point creek, and taking black bass by such device. I found that the parties had ceased operations.

April 27.— At Madalin, at trial of offenders; same day also, discovered fish-weir in trout stream, and had the same destroyed.

April 29.— At Lower Red Hook, swearing to complaint and gathering evidence against parties who maintained fish-weir in trout stream.

May 21.— Traveled Hudson river, stopping at various places to notify shad fishermen of the act passed by the State Legislature preventing the taking of shad from the Hudson river from sunset Saturdays to sunrise Mondays.

June 4.— Traveled Hudson river, stopping at suspected points, to see that the law above mentioned was observed.

June 11.— At Stockport and vicinity, on complaint against shad fishermen.

June 27.— At Catskill, on complaint alleging the taking of underweight striped bass.

June 30.— At Hamburg and vicinity, in search of parties charged with taking shad out of season.

July 3.— At Malden and vicinity, on complaint alleging the taking of shad out of season.

July 6.— Detected parties fishing illegally with net in Hudson river.

July 8.— At Stockport, collecting evidence.

July 11.— At Greenport, at trial of offender.

July 19.— At Copake Lake, further investigating case of offender, pending.

July 20.— At Ancram, to consult parties in relation to case mentioned the nineteenth.

July 22.— At Red Hook, in relation to case pending and reported in April.

July 28 and 29.— At Kinderhook Lake and vicinity, prospecting.

August 2.— At trial of offender at Hudson; case adjourned and still pending. Also, at Poughkeepsie, to consult the district attorney in relation to case subsequently determined.

August 9.— At Catskill and vicinity.

August 10.— At Poughkeepsie, to swear to complaint.

August 13.— At Poughkeepsie at trial of offender, who was convicted of violation charged.

August 25.— At Mellenville, summoning witnesses to sustain complaint against parties for running poisonous matter into a trout stream.

August 26.— At Catskill, on complaint alleging the killing of rail out of season.

September 7.— At Mellenville, on receipt of letters from Seth Green, complaining against mill owners. Visited the place, found the parties complained of, and they agreed to make different disposal of lime-water, and in addition, paid thirty dollars fine and costs.

September 8.— Visited Poughkeepsie to consult district attorney in relation to case at Millerton.

September 19.— At trial of offender at Greenport.

September 29.— At trial of offenders at Greenport.

September 30.— At Poughkeepsie, and swore to complaint against offenders at Millerton or Rudd Pond, charged with having used dynamite or explosives for the purpose of killing fish.

October 1.— At Poughkeepsie, in relation to case pending.

October 14.— At Poughkeepsie and vicinity, prospecting and in consultation with various parties interested in game and fish protection.

October 21.— At trial of offenders charged with using explosives for the killing of fish in Rudd Pond, Dutchess county. District attorney deemed it necessary for reasons presented at trial, to use one of the offenders to convict the other, which resulted in the conviction of the latter.

October 29.— At Rhinebeck and vicinity, on complaint.

October 30.— At Lake Sebasco, Pine Plains and vicinity, on complaint charging parties with the using of nets.

November 16.— Visited Poughkeepsie, prospecting and distributing synopsis of game and fish laws.

November 17.— At Fishkill, Peekskill and Sing Sing, acting as above.

November 18.— At various points on Hudson river.

November 22.— At Poughkeepsie in search of trapped game.

November 23.— At Tarrytown, Yonkers and various stations on Harlem railroad, between Mount Vernon and Chatham, making a general distribution of the synopsis of the game and fish laws.

There were five hoop and one seine nets, and one fish weir seized and destroyed during the past year. Estimated value of all, $125.

HUDSON, N. Y., *December* 1, 1887.

MATTHEW KENNEDY,
Game and Fish Protector, Third District.

FRANCISCO WOOD — FOURTH DISTRICT.

To H. H. THOMPSON, *Secretary of Commissioners of Fisheries:*

The following is a summary of my official operations for the twelve months ended November 30, 1887:

December 13.— I started on a tour to Phillipsport, Sullivan county, at request of Commissioner Blackford, on complaint that fish were being killed by dynamite cartridges. I reported to the district attorney, who brought actions against the parties complained of. At the trial the witnesses did not appear. I called on the district attorney, who said the treasurer refused to advance any money, and the cases went down.

December 27.— Went to Albany to procure evidence of violations of the game laws, and employed a man to make an examination of the books of the railroad company, but for some cause he never reported.

January 8, 1887.— I went again to Albany to look after the matter above referred to, and found the complainants dumb as to any violations; therefore nothing was done.

February 1.— I went to Woodbourne, Sullivan county, to consult the district attorney (at his request) about witnesses, where I spent four days.

February 14.— Went to Monticello, Sullivan county, to attend the trial of the several causes, with the results as stated above. There was one case tried against Preston Killam, for having trout in his possession during closed season. Defendant's counsel raised the point that before the action was brought the law had been changed, and therefore there was no violation on the part of defendant. The court held with the defendant and he was discharged.

April 8.— Went to Albany, looking over the markets.

May 11 *to* 18.— Made a tour along the Schoharie creek, looking after net fishing, from eighteenth to twentieth; same month made an overland tour with team to Albany, by way of the lakes, and found no violations.

May 24 *to* 27.— Made a tour through Schoharie and Delaware counties, along trout streams, and found but one violation, which was for bass fishing, during closed season, and reported to district attorney.

June 4.— Went to Eminence, Schoharie county, on report that parties were violating the law with reference to size of trout taken, but found no evidence of any violations.

June 9.— Went to Mariaville, Schenectady county, in relation to illegal bass fishing with nets, but found no evidence.

June 30.— Went to Schenectady on complaint that parties were fishing with nets, but found no evidence.

July 7 *to* 9.— To Gilboa and Blenheim in relation to illegal trout fishing.

July 23.— Made a tour through Schenectady county in relation to complaint of net fishing.

August 8 *to* 11.— Made a tour of Sullivan county on complaint of Mr. Ira Irwin, post-master of Clayville, that parties from Kingston had taken possession of the trout streams, claiming the sole right to fish, they having leased the lands along the streams. This complaint was made to Seth Green, and he referred the complainant to me. On arriving at the place I found the violation (if any) to be in Ulster county, out of my district. I gave the complainant the name and address of the protector of that district.

September 2 *and* 3.— At Blenheim, obtaining evidence against F. James Fitch and Charles Platner for illegal fishing.

September 17.— To Cobbleskill, to notify district attorney.

September 21.— To Callicoon, Sullivan county, on complaint that parties had put eel-racks in the river. Found one and destroyed it; value about twenty-five dollars.

October 3.— To Cannonsville, Delaware county, where I spent four days destroying eel-racks. Destroyed three racks, one in the west branch and two in the east branch of the Delaware river; value of racks about seventy-five dollars.

October 12 *and* 13.— To Schenectady county, along Mohawk river, looking for violations and finding none.

November 3 *to* 7.— Posting synopsis of game laws. Have also sent synopsis by mail to various places.

November 10 *and* 11.— Went down the Hudson river, below Albany, on the complaint of Henry Shults, that parties were using nets with small meshes, but found no violations.

Allow me to suggest that the season for woodcock shooting should begin the first of September, the same date as with partridge shooting. There have been less violations the past year, partly (I think) for the reason that I have in several counties employed detectives, which fact has been published in the papers, and has operated probably as a terror to poachers

I have also procured the appointment of a protector in the State of Pennsylvania, who has been of great service in helping to destroy eel-racks in the Delaware river, from Hancock to Port Jervis, where the river is the line between the States.

I have traveled during the twelve months ended November 30, 1887, about (3,500) three thousand five hundred miles and expended for traveling expenses one hundred and ninety-six dollars seventy-two cents ($196.72).

FRANCISCO WOOD,

Game and Fish Protector, Fourth District.

SCHOHARIE, N. Y., *December* 1, 1887.

SEYMOUR C. ARMSTRONG.—FIFTH DISTRICT.

To the Commissioners of Fisheries:

As directed by your secretary, Mr. H. H. Thompson, I submit the following summary of my official operations for the year ended November 30, 1887:

I have been engaged 149 days, have traveled 6,705 miles, and expended $250.15 in the discharge of my official duties during the past year.

In my district there are three active, efficient, societies for the protection of fish and game, located as follows: One at Whitehall, in Washington county; one at Lake George, in Warren county; and one at Troy, in Rensselaer county. I hope, during the present winter, to effect the organization of a club at Saratoga Springs, Saratoga county. Several leading citizens have promised me their aid and influence to accomplish that result. Too much can not be said in praise of these clubs. They are composed of good, reliable citizens, who "mean business," and do good work through the whole year. When the time comes that the lion and the lamb can lie down together without the lamb being inside of the lion, I shall try to organize a game protection society in Hamilton county. It requires considerable effort to effect the organization of a game club, but the benefit to be derived is great. I think we had four meetings at Lake George before an organization was perfected. Although it had been well advertised in several county papers, there were only four or five persons present at our first meeting. I adjourned the meeting and advertised it again. At the second meeting the number present was slightly increased. Some thought we could not effect the organization of a club, as there seemed to be an entire lack of interest on the part of those who should have been very much interested. However, at the third meeting a committee was appointed to draft a constitution and by-laws, and at the fourth meeting the organization was perfected. At present it is a strong organization, well officered, and doing excellent work. The same may be said of the clubs at Whitehall and Troy. In regard to the

suits mentioned in my last monthly report, wherein the ex-district attorney refused to deliver the papers to his successor in office, we got an order from the court for the delivery of the papers. The suit against Pasco was tried at the March term. This is the same man I mentioned in my third annual report, who was indicted for hounding deer on the first day of July, and was acquitted by the jury because Pasco professed to be hunting for ginseng with his dogs and gun. In this case we proved that Pasco killed the deer in the pond. One witness saw the deer come in, saw Pasco's dogs come down where the deer came in, saw Pasco when he shot the deer, saw him take it into his boat, take his dogs in and come across where the witness was. Pasco then told the witness and others who were present, that his dogs started the deer at a place called the Burned Timber. All of the witnesses for the prosecution and defense swore that Pasco told them that his dogs started the deer at the Burned Timber. The jury seemed to be composed of men of ordinary intelligence, and with uplifted hand had taken an oath to render a verdict in accordance with the facts, and yet the verdict rendered was, "No cause of action." The charge of the judge was plain and very strong against Pasco, and no one thought he would escape. One of the jurors afterwards told me, that where we failed was "in not proving what became of the deer skin." Another said, "You should have had some one else than the district attorney to try this case." Here is another case: Harris indicted for chasing deer in March. The witness saw the dog in pursuit of the deer. Harris came up on the run and asked witness if he would let him have a fresh dog. Witness said, "No, if I had a gun I should have killed your dog." Harris then went on. The next day witness followed up the trail and found where the deer had been killed. The jury disagreed because Harris pretended he was trying to catch his dog so it would not chase the deer. Of course that explains why he wanted a fresh dog. It was to catch his dog with. In Saratoga county I had case against Cook, before grand jury. In this case Cook actually had proved that he owned a net taken from Saratoga lake. I produced the net (the meshes of which were only one inch) and yet the jury would not indict him. I mention these cases to show you that in three northern counties the trouble for the protectors is not in getting proof to establish the guilt of those who violate the game law, but of finding a jury of "good men and true," who have the integrity, the stamina, and the "sand" to render a verdict in accordance with their convictions. When I look at some of those jurors, I am reminded me of these lines of Burns:

> "O wad some power the giftie gie us
> To see oursels as others see us."

In order for the protector to carry one of these suits through to a successful termination he ought to be endowed with the wisdom of Solomon, the long-suffering forbearance of Job, the fighting capacity of Sampson, and the persistence of the devil. Indeed some of the attorneys use the same implements of warfare that Sampson used to "knock out" the Philistines with, and make up for a lack of evidence for the defense and knowledge of law, by personal abuse of the game protector.

I can forgive them, for like the men who stoned Stephen, "they know not what they do." There is another difficulty that we have to contend with. Every man who intends to run for an office, from constable up, seems to think that it will make him popular to cry out against the game law. One district attorney came to me and asked me to be easy on a man who had violated the game law because he was a relative of an influential politician. The foreman of the grand jury informed me that he had been approached in the same manner. I told the attorney that all I wanted him to do was his duty as an officer. He said he should not press the matter. I do not know as the witnesses had been "seen," but judging from their testimony they could not tell fresh venison from salt codfish. I would respectfully call their attention to the lines of Burns that I have previously quoted. Let me say that I have yet to learn of any officer who has increased his popularity by neglect of duty, or by trying to perform his duties in such a manner that every one will be pleased. My idea is that an officer who is elected to an office and sworn to perform its duties should perform his official duties to the best of his ability, "without fear or favor or hope of reward."

There are many who are willing to give the game protectors advice if not assistance. They say, "you should hire a man to watch this lake or that pond or the other stream." One man who is hired by a club to watch a few acres more or less, said he had done more to protect game than any man in the State. He has had much to say about the game protectors. He tried for the appointment and failed. I asked him how much he could use for expenses. He said he could use $500 or $600 a year if necessary. I told him I thought he could watch a few acres very well with that amount. I then told him that the amount allowed the protectors was limited by law to $250 per annum, and in my district (which extends from Troy to the Blue mountain), if it was equally divided it would allow me just four dollars, sixteen cents and six mills to each county for a whole month. He said he had expended thirty dollars within the last five days. He has had no

prosecutions; no court to attend; no cases to look up; no district attorneys to molest him or make him afraid, and he is in a good position (in his mind) to tell the protectors what to do and how to do it. It would be hard to find a man who could come up to the standard set up by some people for a game protector. He ought to be a statesman, a lawyer, a woodsman, a hunter, a fisherman, and of necessity he must be a Christian either by profession or instinct. If he can not tell what a jack-pot is he would not be anywhere when he came to attend court.

I have spoken of this matter of expenses at some length, for I consider it to be a subject of great importance. The necessity for the preservation of our forest and game is admitted by all thinking, intelligent men. The money expended by the State in propagating fish and protecting game and the forest is of more benefit to the people of the whole State, than that used for any other purpose, if I except the school fund. Therefore the amount should be increased. The Fish Commissioners and Forest Commissioners should receive reasonable compensation for their services, and then their efforts would be better appreciated.

Thirty-four nets and thirty set lines have been taken from Lake Champlain, and over two tons of fish liberated. Two nets and twelve set lines were taken from Saratoga lake. Estimated value of nets and lines destroyed $1,075.

At the last court in October I got two indictments against residents of Hamilton county for crusting deer, and that is certainly a step forward. (You know it has been said that a Hamilton county jury would not indict a resident for violation of the game law.) I have commenced ten suits in Supreme Court against residents of Saratoga, Warren and Hamilton counties for violation of the game law, all of which are still pending. Four other cases commenced some time before, I expect will be tried in March. I consider that the law is generally and reasonably well observed. There is no doubt that there has been a larger increase in game and fish in this vicinity. At Whitehall they report angling to have been the best the past season that it ever has been. Before I was appointed game protector, Governor Cleveland asked me if I thought I could stop the catching of trout and the killing of deer out of season, if he should appoint me. I told him there was not a man living who could entirely stop it. He laughed, and said he was of the same opinion. I told him I would try and make it interesting for some of them, and I think I have kept my promise. Governor Cleveland said game and fish should be protected. In nearly every address that Governor Hill has

delivered the past season he has spoken of the necessity for the preservation of the forest, and I find in Bauvard's Life of Webster, page 223, that the only bill introduced by the great Daniel, while a member of the Legislature of Massachusetts, was a bill to prevent the taking of trout in "any other manner than the old way, with an ordinary hook and line." I speak of this to show that the subject has been of sufficient importance to command the attention of our greatest statesmen, and to suggest if it would not be well for the Legislature, this winter, to take such action, and pass such laws for the propagation and protection of fish and game as shall be of benefit to the people of the State.

In conclusion, I will say I have done the best I could to enforce the law, and have performed the duties of the office of game and fish protector to the best of my ability.

SEYMOUR C. ARMSTRONG,

Game and Fish Protector, Fifth District.

RIPARIUS, WARREN COUNTY, *December* 1, 1887.

JOHN LIBERTY — SIXTH DISTRICT.

To the Commissioners of Fisheries:

GENTLEMEN. — In accordance with instructions received, I respectfully transmit special report from December 1, 1886, to December 1, 1887:

During the year I have been engaged eighty-nine days in the discharge of official duties; have traveled 1,474 miles, and my traveling expenses were $216.77.

In December I went to Ticonderoga to consult District Attorney Dornburgh, and from there to Schroon lake to interview witnesses in three cases to come before the grand jury. On the fourteenth, E. D. Hays was indicted, and on the seventeenth, Nelson Burto, Sam Barton and Antoine McGowan were also indicted for killing deer in November.

In January, I brought James Garvy and James Butler, accused of killing deer in November, before Justice Nicholson. The evidence was insufficient and parties were discharged. Barton, indicted in December, pleaded guilty and was fined twenty-five dollars by Essex County Judge Smith. Burto and Hays gave bail and the cases put over to the June term of county court; McGowan escaped to Vermont. On the thirty-first, started a suit against Edgar Durgin for having fawn skin in possession.

In February, started suits in justice court against Jos. La Moy, Cort Moody, James Huntington and Lyman Johnson for killing a deer. On the twelfth, Edgar Durgin plead guilty and was fined twelve dollars, and on the twenty-third, Lyman Johnson plead guilty and fined $7.45. The cases of La Moy, Moody and Huntington were adjourned. I spent three days at lower and upper Saranac lakes.

On the ninth March I undertook to go to Boreas river but had to give it up owing to the great depth of snow and impassable condition of the roads. On the twenty-ninth, started for Cold Brook and was again forced to turn back on account of snow.

In April I went to McKenzie's pond, at the request of Mr. Cameron, who had been informed it was being fished. I found no signs of it. I also visited the Saranac lakes and Lake Placid. On the fourth, went to Averyville, where I found the carcass of a deer recently killed by one McFarland. I started suit in justice court on the twelfth.

May twenty-first, McFarland was brought before Justice Nicholson, and by advice of counsel, pleaded guilty and paid the penalty, $100. On the twenty-eighth suit was brought against Fred Lewis for killing a deer. I went to Paradox lakes on information given by parties connected with the Schroon lake hatchery that one Smith was taking trout from the brooks and stocking a private pond. He had some 500. On being informed he was violating the game laws, he let them all go in my presence.

In June was in attendance at the Essex circuit, from the sixth to the tenth. I failed to get an indictment against Fred Lewis and the district attorney deemed it advisable to drop it. The Hays and Burto cases were again put over. I spent three days looking over netting-grounds between Addison Junction and Port Henry. Found no signs.

July twenty-eighth on receiving information that a deer had been killed at Square pond, Franklin county, I immediately left for that place and reached the upper Saranac the night of twenty-ninth, and there learned particulars. I also went to Raquette river and Stony creek ponds. On this trip got the required evidence against Jesse Corey for the deer killed at Square pond, and also against Melville Hathaway for a like offense at Round lake.

In August I started suits in justice court against Hathaway and Corey. On the twenty-fifth I drove to Ausable, in the Hathaway case, and to Lake Placid and Wilmington in the Corey case. Was on the road four days.

September seventh, brought Melville Hathaway before Justice Nicholson. He was fined twenty-five dollars and two dollars costs. The twenty-seventh, went to Dead creek, Clinton county. I was

informed nets were in use. Failed to find any signs of nets or anything that would indicate the use of them there. I came to Willsborough the next day, with a like result.

On the twelfth October I drove to North Hudson, and the following day up Boreas river and to Boreas ponds. Found a party here putting up camp. They came out. Drove to Adirondack works in afternoon. Was carried to Newcomb village the fourteenth. The fifteenth walked to Newcomb lake and back to Newcomb. Found two parties at the lake who pretended to be trapping. I think I can get evidence against them sufficient to convict. I also found a party at Cold river, on the seventeenth, but saw neither dog nor venison. This party also left for home. The following four days were put in on the Raquette river, upper Saranac lake, Fish creek and Big Clear pond. At Big Clear I found two Albany gentlemen and guides. They assured me, on their honor, they had done no hounding since October fifth. I do not think there is a party left in that part of the woods. Though I obtained no positive evidence against these parties, visiting their camps has driven them out. Last October I visited nearly the same territory. This time I hardly found one person where there were five last year.

November eighteenth I drove to Morse ponds and visited the lumber camps the following day, but with no success. The twenty-second instant to Lake Placid, and the twenty-third was devoted to looking after cases of Francis and Jos. Merrill, for killing deer March last. I started suits on the twenty-eighth. I am informed deer are being killed at the lumber camps, and that the hunting is done on Sunday almost universally.

It is useless for me to make any suggestion, but, in my judgment, floating or night-hunting — the most destructive and cruel manner of slaughtering the deer — should be prohibited. Allow hounding from September first to October fifteenth, and let that be the open season.

All the respectable guides in my district are alive to the necessity of protecting the game, and from them I am assured of hearty support.

JOHN LIBERTY,

Game and Fish Protector, Sixth District.

ELIZABETHTOWN, ESSEX COUNTY, *December* 1, 1887.

PETER R. LEONARD—SEVENTH DISTRICT.

To H. H. THOMPSON, Esq., *Secretary Commissioners of Fisheries, Brooklyn, N. Y.:*

DEAR SIR.—In accordance with your request, I transmit to you a summary statement, as far as practicable, of work done the preceding year, in the seventh district, in behalf of game and fish protection.

Last winter I was kept busy visiting the different points in St. Lawrence, Franklin and a part of Clinton counties, looking after dogs that were allowed to run at random, and men who were disposed to kill deer in a spirit of wanton vandalism. The men who do the most crusting are an irresponsible class who call themselves "gum pickers." They roam the forest for the purpose of gathering spruce gum, and at the same time they forage on the poor deer all winter, and generally the "picker" has a hound along, which has to be supported somehow. I did my best to stop the crusting, and by the exercise of constant vigilance I think I succeeded remarkably well, considering the immense stretch of territory I was obliged to keep under watch. In every case of violation in which I could obtain sufficient evidence to warrant, I brought suit, and though generally successful, I have been seriously handicapped and greatly embarrassed by the condition of the law which allows witnesses to put themselves upon their privilege, *i. e.*, to decline to answer on the ground that the evidence would tend to criminate them. I wish to call particular attention to this matter, and to strenuously urge that it be remedied as soon as possible. In most cases violations occur in localities but little frequented, and the only attainable evidence, as the law now stands, is purely circumstantial, the persons who could give positive and direct testimony being so connected with the violation as to enable them to claim their privilege. If the law were such that these persons could be compelled to testify, saving their rights by providing that the testimony should not be used against them, as is now the case, I believe in regard to quite a number of actions for penalties, it would greatly facilitate my work. Any one who has not tried to enforce the game laws can hardly realize how great an obstacle the state of the law is to a successful prosecution of offenders.

I visited the waters of Black lake at short intervals, as heretofore. Quite large quantities of fish used to be taken with nets through the ice. As far as I could observe, but little of that kind of work was done last winter. I also visited many of the different lumber camps in this and Franklin county, on the St. Regis, Raquette and Grass rivers, where my presence at intervals of itself checked violations.

The trout law was very well observed. I do not know of any shipping last winter, as was practiced a few years since, and from all I can learn, in most streams, the waters of which are unmolested, the trout are holding their own.

I had occasion to notify Ducy & Backus, manufacturers of lumber on the St. Regis, in Brandon, in regard to the saw-dust and waste from their mill. They agreed to put no more waste in the waters. I think they have kept their agreement, for I hear no more complaints. From all reports, and from my own individual observation, I am satisfied that deer are steadily increasing in number in my district.

The non-marketing of venison is having a wonderfully wholesome effect. I can not too strongly commend this feature of the game law. I sincerely hope it will long continue on the statute books as now in force.

I can now think of but two suggestions to make in regard to the deer law. One is *stop the jack* and the other *stop the dog*. Dogs are taken to the woods for one purpose and only one. They should not be permitted in the forest at all during the closed season.

I do not believe in tinkering and amending the game laws every year, especially by making sweeping and radical changes. It causes great confusion in the minds of the dwellers in the forest, and furnishes violaters with the excuse that they did not know the law; which, while it is not a legal excuse, has some influence with juries where it is smuggled into the case.

In my district the game laws have been pretty well lived up to the past summer and fall There is a healthy and growing public feeling in favor of protection. I have been well sustained by the press of my district. I think we have reason to be very much gratified at the present condition of public sentiment.

In one or two localities some netting has been practiced. I have endeavored in every case to punish the offender. I have destroyed eleven nets and six night lines.

The nets were valued at	$291 50
And the night lines at	30 00
	$321 50

Amount of fines and penalties imposed	$820 08
Amount of fines and penalties collected	425 00
Miles traveled	4,754

I have paid out for my individual traveling expenses $447.42, besides a nearly equal amount in incidental expenses, of which I have kept no exact account as they came out of my own pocket.

I suppose there is very little use in making any suggestions in regard to the necessity of more means to do this work with. My territory is so large, however, that while I try to do the best I can with the means at my disposal, I am constrained to believe that with more money I could accomplish better results. My entire time and attention are devoted to the work. The seventh district, embracing as it does about eighty-five miles of river frontage besides the Adirondack wilderness, calls for constant activity on my part and I think does not call in vain; but with all my effort I can see opportunities where the expenditure of a little more money would, in my judgment, be productive of very beneficial results.

Very respectfully yours.

PETER R. LEONARD,
Game and Fish Protector, Seventh District.

OGDENSBURGH, N. Y., *December* 1, 1887.

THOMAS BRADLEY—EIGHTH DISTRICT.

To H. H. THOMPSON, *Secretary Commissioners of Fisheries:*

I submit herewith a summary of my official work for year ending November 30, 1887.

My last annual report closed with the month of November, 1886. In December of that year I traveled 194 miles in the discharge of my duties, and my expenses were $20.75. On the eighth of that month attention was directed to an article in the Albany *Argus*, wherein it was alleged that timber thieves in Herkimer county were killing deer in large numbers, and shipping the hides to Gloversville and Johnstown to be made into gloves. The allegations were made upon the authority of Dr. Berger, of Ballston. I went immediately to Ballston to consult the doctor, when he informed me that he knew nothing of the matter beyond the fact that he had heard some parties say they meant to have some venison. I then visited the scene of the alleged deer killing, but was unable to learn anything of the "great slaughter" by which the skin markets of Gloversville and Johnstown were being supplied. The whole thing was simply a canard.

On the 1st of January, 1887, District Attorney Parke, of Fulton county, retired from office, by expiration of term, and was succeeded by William Green. It gives me pleasure, in this connection, to bear witness to the uniform courtesy and kindness of the retiring district

attorney. I have found him willing at all times to render any aid in his power, and his advice has been many times very useful to me. His successor, District Attorney Green, promises to second all my efforts to enforce the laws, and I expect much valuable assistance from him. On the twenty-fourth of January I commenced an action in the Supreme Court against Anthony Mathes, of Gloversville, for having six partridges in his possession, out of season. The suit was for a penalty of $150. I also made complaint against him for a misdemeanor, for the purpose of sending the case to the grand jury.

My memoranda showing number of miles traveled and amount of expenses incurred has been mislaid, but as near as I can estimate the figures would be: Miles traveled, 330; expenses, $24. The correct figures were given in my monthly report.

On the twelfth of February I made complaint before the Fulton county grand jury against Patrick Tully, of Caroga, for hunting rabbit out of season; also against Edward Brower, Christopher Brower and Edward Terrell, of Mayfield, for crusting deer at Jackson Summit, where they had broken up a yard of five deer. In the case of Tully the evidence was not sufficient to procure an indictment. In the matter of the Browers and Terrell, and indictment was found against Ed. Brower, for whom a bench warrant was at once issued. He had, however, fled the county, and was not apprehended until sometime in August, when the sheriff took him in custody. He was confined in the county jail about two weeks, when he gave bail and was released. His trial is set down for the December sessions. On the fourteenth of the same month I made complaint against John Peck, John Wadsworth, Charles Wadsworth, Dan Wadsworth and William McGuire, all of Hamilton county, for crusting deer, and indictments were found against them by the Fulton county grand jury. In this connection it seems proper to refer to the action of District Attorney Brownell of Hamilton county, who claimed Fulton county had no jurisdiction in the cases, and so advised my witnesses, some of whom he endeavored to have disregard their subpœnas. The parties were arrested and arraigned before Justice Potter at Johnstown. They were accompanied by the counsel, Hon. L. L. Boyce, who moved for their discharge upon their grounds that a Fulton county grand jury had no jurisdiction over offenses committed in Hamilton county. After hearing Mr. Boyce in favor of the motion and District Attorney Green against the same, the court directed the respective counsel to submit briefs to him in chambers. He released the prisoners upon their personal bond of $100 each, pending a decision of the motion. At this writing a decision had not been rendered.

During this month I traveled 334 miles and incurred expenses to the amount of $32.55.

On the first of March I commenced actions in the Supreme Court against William McGuire, John Wadsworth, Dan Wadsworth, John Peck and Edward Brower, parties above mentioned, for penalties for crusting deer (the same transaction for which they were indicted in February). The penalty sued for in the case of Brower was $100; in the other cases $300 each. Cases have not yet come to trial.

Miles traveled, 531; expenses, $28.56.

On the thirteenth of April I made a trip to Wells and Griffin, Hamilton county, seeking evidence against the Wadsworths, Peck and McGuire. I placed the papers in the hands of Sheriff Gilman for service. The sheriff promised to coöperate with me in the detention and punishment of offenses against the game laws in Hamilton county. On the twenty-sixth I visited Albany and Greenbush in search of evidence against parties fishing in the Mohawk river. I made strong cases against four parties, but the Montgomery county grand jury failed to find indictments.

Miles traveled, 449; expenses, $26.41.

May thirtieth I made complaint against Albert Smith, of the town of Wells, Hamilton county, for grappling trout, and placed the matter in the hands of District Attorney Brownell, for presentation to the grand jury. I also filed information against other parties, for shooting ducks.

Miles traveled, 364; expenses, $27.35.

In June I attended the term of County Court and Court of Sessions at Sageville, Hamilton county, for the purpose of assisting the district attorney in procuring the indictment of Albert Smith and others, for violations of the game law. The evidence against Smith was very strong, but the grand jury failed to find a bill. In the other cases the obstacles thrown in my way were such that I was unable to secure satisfactory evidence.

Miles traveled, 650; expenses, $24.98.

A large portion of the month of July I spent in the woods, looking up violations of the game laws. I traveled 214 miles, and incurred expenses to the amount of $18.50.

The month of August was, in some respects, a repetition of July. I spent much of the time in the woods, and as a result of my investigations was enabled to secure evidence against D. C. McNaughton, of Jersey City, N. J.; S. P. Carmichael, of New York; J. M. Carmichael, of Caledonia, and Ceylon Clark, of Spruce Lake, for violation of the game law, in hounding deer at Spruce Lake. Upon this evidence I

based a joint action against the parties, for a penalty of $200. The action was commenced on the twenty-sixth of August, by Hon. C. W. Smith, county judge of Hamilton county, acting as my attorney.

Miles traveled, 409; expenses, $29.26.

On the twenty-third of September I settled the case against the Carmichaels, McNaughton and Clark, above referred to, the defendants paying the amount of the penalty, $200, and twenty-five dollars costs.

I received a communication from Cleveland, Oswego county, in regard to violations in Oneida lake, and referred the same to R. U. Sherman of the commission.

Miles traveled, 672; expenses, $35.66.

On the eighth of October I started on a trip through the woods, going in by the way of Arietta and Piseco lake, and coming out by way of Wells and Northville. I visited several lumber camps and some sporting camps. I found the dogs tied in every instance, something heretofore unknown. I think the prosecution of the Carmichael case, with the prompt and decisive result obtained, has been productive of much good. On the fourteenth I made complaint against M. J. Kennedy, of Gloversville, for taking trout from Johnson's pond. The case was presented to the grand jury of Fulton county and an indictment was found. On the twenty-fifth I commenced an action against Kennedy for penalties to the amount of $375.

Miles traveled, 377; expenses, $43.86.

During the year I have recived penalties as follows: In February, the action against Anthony Mathes was settled for seventy-five dollars, and all proceedings were discontinued. The defendant paid costs to the amount of sixteen dollars, in addition to the penalty of seventy-five dollars. Of this sum $37.50 was paid to the treasurer of Fulton county, and $37.50 retained by me as provided by law.

In September the Carmichael case was settled by the payment of a penalty of $200 and twenty-five dollars costs. Of this sum $100 was retained by me, in accordance with the law, and $100, less four dollars and seventy-five cents sheriff fees, was paid to the treasurer of Hamilton county.

In the performance of my duties I have received much valuable aid from the officers and members of the Johnstown Gun Club, George Yost, president, and from the Gloversville Gun Club and Protective Association, M. C. Treadway, president. Such organizations are capable of a great deal of good in ferreting out, punishing and preventing violations of the game laws, and the Gloversville and Johnstown clubs seem thoroughly in earnest in the work.

The month of November has thus far been spent by me mainly in searching for witnesses in suits already pending for violations of the game laws, and no further actions have been brought.

Miles traveled, 564; expenses, $26.69.

I have traveled a total of 5,088 miles in the discharge of my duties during the twelve months covered by the above report, and the expenses incurred amount to $338.57, an excess of $88.55 over the amount appropriated for that purpose.

In regard to existing game laws, I may be permitted to suggest that some changes should be made. The open season for woodcock and partridges should begin the same day. It is my opinion that the present fish laws can not be improved.

The present law in regard to deer is not, in my judgment, sufficient for their protection. There should be a penalty for any deer-hound kept in camp during close season, as it is presumptive evidence that they are there to be used when the coast is clear; and in the absence of such a law the dogs will be run in close season. The large territory over which I am compelled by my duties to traverse, makes it very difficult to detect them, or even to get evidence on which to base an action.

THOMAS BRADLEY,
Game and Fish Protector, Eighth District.

ROCKWOOD, N. Y., *December* 1, 1887.

JOHN L. BRINCKERHOFF — NINTH DISTRICT.

To the Commissioners of Fisheries:

I respectfully submit the following report of my work from December 1, 1886, to December 1, 1887, in which time I have traveled (2,576) two thousand five hundred and seventy-six miles and paid out for expenses ($245.48) two hundred and forty-five dollars and forty-eight cents, and have spent (116) one hundred and sixteen days from home in the discharge of my duties as protector, and have obtained judgment against a party of four persons for ($272.83) two hundred and seventy-two dollars and eighty-three cents (including costs) for killing deer and fishing through the ice, and have eleven cases for killing and catching deer last winter, in the Supreme Court of Oneida county, and have one case just ordered for killing deer in June last, and one case for fishing spawning beds with nets last month. I destroyed one set line in May last, eighty feet long with fourteen hooks, of but little value. I find a better sentiment in favor of the game laws this years than before. People view them in a different light from what they used to view

them, and there are more in favor of them every year. But there will be more or less violation of them as long as game lasts. There is one disability that a protector has to contend with, and that is the limited amount for expenses that he has to work with. It does not keep him out on expense as much as he should be, and he should be allowed to send private detectives out on some occasions for a few days. I think the season for speckled trout should close with September first, as the most of them begin to congregate near their spawning beds by that time, and the law should be more uniform throughout the State. There seems to be plenty of deer in some parts of the Adirondacks, and in others scarcely any. My observation is that where there has been the least dog running there are the most deer. They seem to gather in those places to keep out of the way of the hound. But floating is the most destructive method of hunting deer, and with the increased number of tourists going to the Adirondacks each year, deer will soon be of the past unless they are better protected.

J L. BRINCKERHOFF,
Game and Fish Protector, Ninth District.

BOONVILLE, *December* 1, 1887.

NATHAN C. PHELPS—TENTH DISTRICT.

To the Commissioners of Fisheries:

I respectfully submit the following special report of my work for the year ending November 30, 1887. Traveled during time 2,270 miles, at an expense of $241.76, and devoted 146 days time in discharge of official duty.

December 1886.—Went to Wilmurt, Herkimer county, to see complainant Conkling about a violation of the fish law. Found him on his death bed, and consequently could not see him. I also visited Trenton, on complaint that parties were netting fish, and on investigation found they were only spearing suckers. Also visited Forestport and Pine creek to see about parties crusting deer and keeping them alive. Also two days at North and South lakes, looking for violations, and one day to Utica to see district attorney about suits.

January, 1887.—To Utica to see district attorney, and commenced suit against Arthur Bellinger for violation of fish law. I also visited Alder Creek, Forestport, Reed's Mill, North, South and Jock's lakes, Barber's camp and four or five other camps in that vicinity, looking for violators.

February.—Went to Boonville to see district attorney, to make complaint in the Bellinger suit. Two days to Forestport and White

lake, looking for violations. On information received from A. Hess, of Prospect, that deer were being killed in the vicinity of Jock's lake outlet and Griff. Evans' place, I visited the Point and found that parties or dogs had been killing deer, and also have commenced suit against one Edwin Wells for same. I also visited Prospect one day, to obtain evidence in regard to Wells' case; also one day to Utica to see district attorney, but did not find him at home.

March.— Went to Forestport to see R. Putney, and also to Pine creek, to see about violation. I also received information that parties were or had been crusting deer in the vicinity of Otter lake and Moose River. I visited that place, but a heavy fall of snow the night previous prevented me from ascertaining whether or not any violations had been committed. I also went to North and South lakes, and remained four or five days, and from there to Jock's lake, and out on to West creek. Did not find any signs of violation. I also spent one day at Prospect, on Flansburg case.

April.— On the first I went up to Big spring, on information that parties were netting trout there and, on investigation, I found parties fishing there with hook and line, but no nets or signs of any, being used there. I also went to Bardwell's pond; found where three or four holes had been cut through the ice. One day to Herkimer to see district attorney about suits. On the twenty-first I visited North and South lakes and vicinity and remained four days; found no one there or any signs of violations. Twenty-fifth I went to Utica on call of district attorney.

May.— Third, went in to North lake and also to South lake and camps. On the eighth, I went in to South lake and remained for eight days in the vicinity of South lake, South Branch, Little Salmon, etc. On the twentieth I went in to North and South lakes to look for set-lines and poles, etc.; also, one day to Bardwell's to get evidence in regard to catching trout out of season, but did not find sufficient proof to go on with suit.

June.— Went to Prospect, on complaint of A. S. Bagg, in regard to a party finding a net at Pardysville, on West creek; also, four days up West creek looking for witnesses in Wells and Flansburg cases. On the thirtieth I went in to North lake.

July.— First and second, in vicinity of North and South lakes. Thirteenth went to Holland Patent and Nine Mile creek on information that parties were netting trout and found parties spearing suckers; no nets or signs of any. I also went in to North, South and Little Woodhull lakes, and staid five days watching for floaters. Twenty-third, I went to Little Woodhull lake and watched for floaters, but

no one came; also, one day to Prospect to see about parties fishing with nets.

August.—First, on information received from *Utica Press* that a party had found a net and taken it to Prospect, I visited that place and could not find any one that had seen a net or heard of it, and on visiting Pardysville I could not find any evidence that any one there had found it or seen one, but simply made the assertion to hear themselves talk. I also went to Boonville and obtained permission of Superintendent Phillips to raise the gates at Twin lakes, my object being to see whether or not the drawing off of the water would kill the fish. I went there, raised the gates and watched the lakes day and night, until they were drawn down, and only saw two or three dead trout where there were 500 or more last year. I also visited the lakes on the thirteenth, and only found one dead fish. On the sixteenth I went to Mud lake on information that parties were there dogging deer, but found no one there; twenty-first and twenty-second at North lake and Black river looking for dogs, but saw no signs of any. On the twenty-seventh went into woods and remained the balance of month in the vicinity of North, South, Jocks and Mud lakes, and no dogs were run before time in that section, but there was any number of men and dogs there ready for business on the first.

September.—During this month I visited North, South, Jocks and Canachazala lakes, and two days up West creek looking up evidence in the Flansburg and Wells cases. There was but little to do in the woods this month as the season was open for all kinds of game and fish until the fifteenth instant.

October.—First, spent time in the woods looking up dogs and seeing that they were taken out of the woods and stopped running. Received order from Commissioner Sherman to go in on West creek and see if dogs were running there. On the twelfth I went in to South lake and remained two days, and from there to Little Salmon lake and the vicinity of Jock's, and over on to West creek, and up the creek to Indian river, over back of Barber's camp on Jock's lake, and down to Jock's lake outlet on Canada creek, and out to Wilmurt and down the creek, and found no dogs running and no parties in that section of the woods, except two dogs at camp on South lake which I sent out by S. R. Fuller, of Holland Patent. I spent two days attending Justice Court in Remsen; one day at Utica to see district attorney about suits; one day at Boonville to subpœna witnesses in Miller suit, which was with drawn as witnesses could not be reached (for a violation of section 19.)

November.— Went to North lake on way to South Branch spawning bed and found a good many trout on beds and no sign of their being disturbed; also on receiving information that a party was at Jock's lake outlet with dogs, I visited that place and found a party of seven camping there and brought out their dogs with me, but found no signs of venison or that they had been running any deer; also to Wilmurt to get evidence in two cases that will be tried as soon as the court decides where they can be tried. I also have several other cases to commence as soon as District Attorney Jones informs me whether they can be tried in Oneida county or not. In conclusion I would say, as a general rule the game laws have been respected in my district. I have ferreted out all complaints that I have seen or heard of. I have now four suits in Supreme Court, Oneida county; one against Alva Dunning for violation of section 19, Laws of 1885, commenced September, 1883; William A. Matteson, district attorney and Thomas S. Jones, defendant's attorney. Since that time Thomas S. Jones has been appointed district attorney. Also one against Frank Flansburg for crusting deer; one against Edwin Wells for same offense; one against Arthur Bellinger for violation of section 19.

I will also suggest that the deer season be cut off fifteen day (to September first) and be allowed fifteen days in November (to September first) for still hunting, as deer are better in the month of November than any part of the year; also woodcock should not be killed in Herkimer county until September first, the same as Oneida county, as it gives poachers a chance to kill off young partridges. I have received more help from officials in the past year than ever before, and to whom I return my sincere thanks, viz.: District Attorney Thomas S. Jones and assistant William Townsend, Attorney John D. Collins, and also Hon. H. J. Coggeshall and others who have assisted me in my work.

NATHAN C. PHELPS,
Game and Fish Protector, Tenth District.

REMSEN, N. Y., *December* 1, 1887.

FRED P. DREW — ELEVENTH DISTRICT.

To the Commissioners of Fisheries:

I herewith submit my report for the year ended November 30, 1887.

You are doubtless well aware, from an examination of my monthly, as well as special reports, that my efforts in the discharge of official duties, during the past twelve months, have been greatly embarrassed by the course pursued by some of those, whose professions, no less

than the honorable positions they occupy, should be a sufficient guarantee that they would be always foremost in upholding every law upon our statute books, instead of which, by openly arraying themselves on the side of the defendants, in aggravated cases of violations, they have, of necessity, encouraged those who set all law at defiance. And yet a careful review of the whole field of operations will convince even the most skeptical, that in many instances, very gratifying results have crowned my efforts.

In the thirteenth district I secured evidence against thirteen persons for violations of section 23 of the general law. Before suits could be commenced several came forward and pleaded guilty, offering terms of settlement which were approved by the district attorney; two paid one penalty of $100, no costs having been made. Proceedings were commenced in Supreme Court against the others, who, with two or three exceptions, promptly acknowledged their error and made overtures for a settlement; three of these paying one penalty and costs. Against two, judgment was taken by default, and executions have been issued. In the same district I brought suits in Supreme Court against two others for violations of section 21; neither defended.

One day passed on Oneida lake, in May, with Protector Lindley, resulted in the capture of twelve large trap nets and one first-class gill net, besides other appurtenances, the whole probably worth, at a low estimate, over $700, to say nothing of dumping loads of choice fish from the nets into the lake. The condition of these nets, literally daubed with spawn, afforded ample proof of the importance of protecting such bodies of water, especially this, one of the most valuable food producing waters in our whole country.

By special order of one of the commissioners I visited the Adirondacks in August, a few days before the opening of the hounding season. The section visited embraced a portion of the counties of Herkimer and Hamilton. This part of the forest preserve has, within a few years, become noted as one of the best in the whole wilderness for deer hunting, while before the organization of a well-known club, whose ample domain and watchful care cover all approaches from this side, it was considered by experienced guides and hunters quite the reverse. A notable example of what can be accomplished by a club or society of genuine sportsmen, seconded by a little protection by the State.

I found a party of four sportsmen and two guides, on the South branch of Moose river, actively engaged in hunting deer by the aid of dogs. I invited the sportsmen to accompany me to Boonville,

to meet our district attorney; they accepted and paid two penalties. The guides were well known and I left their cases subject to the pleasure of the commission. My opinion, however, is that all guides should be taught that it is as unprofitable to be hired to violate the game laws, as it is the revenue or other laws. I do not believe you could find one of these men so ignorant of the law or indifferent to the consequences that, if placed on the St. Lawrence river, he could be hired to row his boat for smuggling purposes. He would tell you at once he dare not take the risk. Later in the season I again visited the Adirondacks by special order and secured sufficient evidence to warrant an affirmative verdict against several others, for violations of the first section, and only await the convenience of the district attorney.

From information obtained from reliable parties, as well as from my own observation, I am convinced that there should be prompt and thorough legislation upon the subject of deer hunting. Just as long as dogs are allowed to run deer, even for a short time, it will be exceedingly difficult to prevent hounding the remainder of the season. Unless something is done to shorten the season, or lessen the number allowed to be killed by a party, they will be, like the moose, utterly exterminated.

In this district, early in the season, I found a party violating section 23. I secured three squat nets and rigging, and by advice of local friends, brought actions against four persons before the city judge for a misdemeanor. They all pleaded guilty, and were fined two dollars each, and sentence was suspended. As yet I have been unable to learn under what statute the court was acting. Proceedings were then commenced in Justices' Court for the civil penalty. They appeared with able counsel, and took the cases to the City Court. We at once withdrew the complainst. Further proceedings and intentions, with our reasons for the same, have been fully reported to the commissioners, and should not be proclaimed at this time.

In January I commenced action in the Supreme Court, in the fourth district, against the parties alluded to in my last report. Acting under the repeatedly expressed wishes of well-known townsmen of the defendants, I employed counsel to conduct the case, as their district attorney was not willing to proceed against them.

When the papers were served, one of the defendants remarked, "the district attorney and (naming a prominent citizen, an officer of a well-known fish and game protective association) won't allow me to pay a dollar."

This, too, when it was well known that ample evidence had been secured against every one of them, for very aggravated violations.

I may add that all proceedings connected with the case referred to above were commenced and continued thus far by the request and with the full approval of one of the principal officers of this same distinguished protective organization; a well-known gentleman who has long been distinguished for his zeal in the cause of protection, rather than for consistency of late. One of my special reports covers the situation, and obviates the necessity of further allusion to the subject in this place, beyond the statement that a heavy calendar has prevented the trial of these actions; but it is expected they will be reached at the next term of court.

In the tenth district I have several cases in the Supreme Court that have been put over several times; not by reason of incompetency or collusion on the part of the district attorney, but because of the large increase of crime in some counties, loading the district attorney's office to its full capacity. At a recent term of court, the time of the district attorney was fully occupied by the grand jury. However, I am assured that the next court will dispose of the above cases.

In several counties vexatious delays have occurred, even when the district attorney has been notably one of the ablest and most faithful members of his profession, and has tried to exhaust every honorable means in his power to further the cause of protection.

I have been told, however, that in one county overtures in the interest of both candidates for the office of district attorney were made to the parties awaiting trial for violations of the game laws. If such was the case I almost wonder both were not elected.

In a former report I alluded to the necessity of an amendment to the present law, regarding the bringing of suits. The interests of protection would be greatly advanced if a change in this respect could be effected.

In my last report reference was made to suits in the county of Otsego. Three of the defendants offered the district attorney terms which were approved by our friends, and their cases were accordingly settled. Several others offered to plead guilty and pay a portion of the penalty demanded, but for some reasons changed their minds and negotiations were broken off.

Before the next term of court, Mr. Brewer became district attorney. His predecessor, Mr. Barber, had discharged the duties of the office with signal ability, and in the interests of the people, and I was assured by him, as well as by leading citizens of Cooperstown, that I would find his successor equally able and zealous in the cause of protection. For a time this opinion prevailed.

About the time he took possession of the office, he told the district attorney, in my presence, to keep all the game cases already commenced, and finish them.

Accordingly, there were on the calendar of the January term of Supreme Court sixteen game and fish cases; one was tried. The protector, and a disinterested witness, testified to seeing the defendant taking up a net, and that subsequently the defendant admitted it, and offered to pay a portion of a penalty; all this in the presence of the witness. The defendant testified that he was present at the time and place mentioned by the prosecution, but said he was trolling and only caught one sucker. He was supported by his companion, but who said they did not catch a fish of any kind.

Judge H. Boardman Smith, in his charge to the jury, said perjury had been committed, and plainly indicated by whom. The jury found for the defendant.

The court suggested that as the large number of game cases already on a heavy calendar, were much in the way of other civil business, they should be transferred to the County Court. Accordingly, a stipulation transferring them to the County Court was signed by all the attorneys connected with the several cases.

The course was thought to be perfectly safe, as far as the interests of the people were concerned, and I believe it was at the time.

The County Court at that time was presided over by one who, like his predecessor, was distinguished for his probity as well as legal ability. His practice had not been confined to the court of a justice of the peace, before his election to the office of judge.

Before the next term, however, providence had suddenly removed him by death, and a successor was appointed, and in March the court convened. The first case called had been noticed for trial by the ex-district attorney, in the name of the district attorney. The notice was retained. The defendant's attorney had already noticed it for trial, directing the notice to the ex-district attorney, as attorney for the plaintiff. The ex-district attorney filed notes of issue, in the name of the district attorney, and indorsed them in his own name. Defendant's attorney filed a note of issue with the ex-district attorney's name as plaintiff's attorney.

A few days before the opening of the court the ex-district attorney obtained an order for the examination of one of the witnesses before trial, and defendant's attorney, pursuant to notice thereof upon him, attended and cross-examined. This was on the fifth. On the seventh, the first day of the term, without prior notice of such intentions, and before the case was moved for trial, the defendant's attorney asked the

court to strike it from the calendar. The witnesses for both sides were in court, and the district attorney stated that he had authorized the ex-district attorney to prosecute the actions, and wished him to do so. The court, notwithstanding all these facts, ordered all the game cases struck from the calendar.

The ex-district attorney appealed from the order to the General Term, where, as I understand the matter, the question was not decided, but merely dismissed the appeal.

At the next term (October) the cases were noticed for trial by the district attorney, who also informed the ex-district attorney that he could proceed with the case; but as soon as he failed in one all the others would be withdrawn by himself.

On the trial of the first case, the court refused to rule that proofs of violations in June would sustain the allegations of on or about September, and also refused an amendment to the complaint.

The ex-district attorney having thus failed in one case, the district attorney at once withdrew all the others, never at any time having consulted me concerning them in any way.

There were several indictments connected with the October term, that had at least the charm of novelty about them.

Nearly every member of the bar took particular pains to manifest their sentiments on the side of the defense. The ex-district attorney stood alone, while the defendant's attorneys were constantly aided and coached by the others, and but for the fact that the sheriff showed the same allegiance to the game laws that he did to all the others upon our statute books, it would have been exceedingly difficult for the prosecution to have kept a witness in the court-house during the proceedings. They seemed to go about the village, when and where they pleased, with perfect impunity.

It was well understood that Sheriff McCredy would not violate his oath of office, on the plea of expediency of any sort, but instead, when approached more than a year ago with the hint that he too might have a string of nice fish placed by his back door on fishing nights, declined the offer with the same firmness that he manifested in refusing a late offer to exchange one of the large nets I had placed in his hands for a barrel of choice fish, carefully salted for future use. Said he: "I don't want fish taken in that way. I prefer to buy mine, or to go without."

The judge remarked in open court: "I don't think there is anything more dangerous to the rights of the people than a game protector commencing indiscriminately actions, without regard to the evidence being worked up upon which the actions were based. The

game protector who neglects to do this, comes far short of doing his duty, and is a dangerous man in the community."

The ex-district attorney replied that he was doing me injustice; that out of a very large number of cases I had in that county, he had never been asked to commence an action until he was fully satisfied we had ample evidence to support the case, and that in every instance we had from two to six competent witnesses.

The judge then remarked that he did not refer to me.

Just before the district attorney withdrew the several cases, the ex-district attorney stated in open court that he was authorized by the protector to offer to take all of these cases out of this court, and try them before any justice of the peace in the county, first giving security for costs.

The offer was not accepted.

The result of all this was soon apparent. Netting in Otsego lake thus far had been done only by stealth, and the fish thus caught quietly sent to other markets, except perhaps a portion "placed where they would do the most good," but almost before the adjournment of court, boldness took the place of craft, and soon all restraint was thrown off. Nets were used by daylight, spawning beds were raked, and the fish were peddled about the county.

Then even the indifferent became alarmed, appeals for aid were sent even to the Executive chamber as well as to subordinates, and their board of supervisors was appealed to. Indeed, such was the condition of affairs, that one of the village papers, which in January referred to the "unpopular fish suits," in November complained of the situation, particularly of the wholesale robbery of spawning beds.

Fortunately their local legislature believed in heroic treatment for the complaint, and I am informed nobly performed their duty, repealing the former pot fisherman's law, and enacting one in its place. This, I believe, will render a conviction possible, even in Cooperstown.

I have a number of other cases of violation, some of them in other sections of the county — ready to prosecute — but I think it inexpedient to proceed, until I have exhausted further efforts to have the old cases reinstated.

In conclusion, permit me to avail myself of this opportunity, to express most sincere thanks to a number of well tried friends, in the several counties I have visited since my last report; nor would I forget in this connection the officers and members of some of the protective clubs in the interior of the State, some of whom have taken a more

active interest in our work during the past season than ever before, thereby greatly promoting the efficiency of the service, and encouraging the hope of still better results in the near future along the whole line.

FRED P. DREW,
Game and Fish Protector, Eleventh District.

WASHINGTON MILLS, N. Y., *December* 1, 1887.

WILLIAM N. STEELE — TWELFTH DISTRICT.

To the Commissioners of Fisheries:

I herewith submit my report for the year ended November 30, 1887: During the year my entire time has been given to looking after violators of the game and fish laws, and I have no other business. I have answered every complaint as fully as the circumstances would warrant, and have been constantly on the alert to stop violations of the law. My district is a large one, and is one so situated that violations of the law are almost entirely by use of nets in fishing illegally. The illegal net-fishing in the St. Lawrence river has for many years been a matter of notoriety. It has been quite closely confined to that portion of the river lying between Tibbitts' Light, at its source at the foot of Lake Ontario, and a point some seventy miles below; about twelve miles above Morristown. This is the portion of the river lying to the northward of Jefferson county, and comprising the Thousand Islands. The river is an average of six or seven miles in width; one-half of which is on the American side. It has in it an almost innumerable number of islands, while its shores are lined with bays and inlets. It is natural ground for the feeding and breeding of fish, and particularly for game fish. Its waters are clear and cold, and the black bass, muscalonge, pike, pickerel and perch, when not taken by nets, propagate with great rapidity. This is also true of that portion of Lake Ontario from Oswego to Tibbitts' Light. It has large numbers of islands, and bays and inlets from rivers which extend far back into the country. Over this region illegal net fishers have reigned for years. Until some five years ago they were unmolested; no nets had been destroyed, and no attempt made to stop the netting.

It should be stated that while netting has been so constant, it has still been the business of but comparatively few people. It is only a hundred or two of people who have profited by the illegal fishing. But they have held to it with a tenacity which is astonishing. The famous resort of the Thousand Islands and of the lower portion of

Lake Ontario for summer tourists, needs no mention; and yet it is famous only as it is famous for its fishing. People can see it by making a trip down the river; but they stay there to have the scenery and the fishing. The tourists of this region have expended millions of dollars in improving the islands and shores of the St. Lawrence river. These improvements would never have been made only to a slight extent, but for the fishing of the St. Lawrence river. More than a million of dollars are expended each year by those who visit this portion of the State, to say nothing about those who merely pass down the river to view the scenery. If we look at the millions expended in handsome residences and improvements of every kind and at the enormous amount expended each year by all persons from all quarters of the globe, and consider the great value to the State resulting from this, and then consider that a very small number of net fishers, if let alone, would entirely ruin the property and the region by destroying the game fish, it must be admitted that no effort can be too great and too earnest which is directed towards protecting the game fish of these waters. Left to this work, a hundred men or so would eke out a poor living for themselves and their families, while totally destroying this famous summer resort. Doubtless, each one of them could make as good or a better living elsewhere. To stop them from net fishing is quite as much a blessing to them as an injury. It ought to be understood and remembered that while the Thousand Islands' region became famous for its fishing some years ago, the fishing later became so poor and the waters so depleted, that five years ago it was almost impossible for an angler to secure a box of fish to send to his friends. With the protection which has since been given to the river the fishing has been rapidly improved, and during the past season the hotels have been crowded as they never have been before. It is a matter of fact that during the last five years protection of fish has been of the most enormous benefit to the county of Jefferson and to the State. It seems impossible that any resident of the State should look at the great good resulting to the State from the stopping of illegal netting, and then conclude otherwise than that all possible energies should be used to protect the river, and that all honorable means should be used to completely drive away the net fishers, and secure absolute compliance with the law of the State, which forbids the use of nets of any kind in these waters. I am happy to report that net fishing has been very nearly stopped. There used to be much pleasure in securing and destroying the murderous nets. But where we look at the rapidly increasing quanties of fish caught by anglers and the great

increase in property value in this region because of the improvement in the fishing, it certainly becomes a greater pleasure to search for nets and not find them. Each year sees more and more net fishers abandoning the business. Each year brings the work of protection nearer perfection. It must be that time will bring absolute protection for these waters. My memorandum book shows that I have been away from home in the service of the State 202 days. I have traveled, mostly in my row boat, 1,936 miles. My expenses have been $195.02. My efforts have resulted in securing 119 nets, of which the estimated value was $2,170. A large portion of these nets were taken in the Lake Ontario region and the adjacent rivers and but a few of them from the river St. Lawrence.

I have frequently called your attention to the valuable works of the Anglers' Association of the St. Lawrence River. The gentlemen composing this association are untiring in their efforts for the protection of the river. Mr. Daniel Staring, of Alexandria Bay, has been in the employ of the association, and has coöperated with me in my work upon the river constantly and has done valuable work by himself. I have also been greatly assisted in my work in this district by the Southern Jefferson County Association for the Protection of Game. Any one in the least familiar with our game laws must know how greatly they are damaged and rendered inefficient by their obscurity and mixed meaning. I strongly recommend that some steps be taken to have the fish and game laws simplified, so that the duties of the State game protectors, in their efforts to enforce the laws, can be clearly defined. Surely nothing in connection with the protection of game and fish can be more necessary than a clear understanding of the laws.

WILLIAM N. STEELE,
Protector Twelfth District.

CLAYTON, JEFFERSON COUNTY, *December* 1, 1887.

WM. H. LINDLEY—THIRTEENTH DISTRICT.

To the Commissioners of Fisheries:

At the request of your secretary I respectfully submit the following summary report of my official proceedings for the past year:

DATE.		No. of miles traveled.	Disbursements for travel, etc.
1886.			
November 1	Balance from report of 1886	.....	$121 91
3	Went to Utica and to Lakeport, Oneida lake	75	4 08
6	Went to Sylvan beach, Frank Lander's case	18	2 50
10	Went to Bridgeport and to Shackleton's Point, Oneida lake,	33	4 00
		.....	$132 49
December 17	Went to Fulton, Oswego county, Constantia cases	100	$3 48
30	Went to Sylvan, Oneida lake, Frank Lander's case	20	2 00
		.....	$137 97
1887.			
January 6	Went to Syracuse, Constantia cases	100	$3 84
8	Went to Lakeport, Oneida lake	26	2 50
17	Went to Syracuse to attend court	42	2 09
19	Went to Clockville to see witness, Lakeport case	4	75
21	Went to Syracuse to see witness, Lakeport case	84	1 84
24, 25, 26, 27	Was at court, Morrisville, Madison county; took six witnesses	30	9 00
	(Actual expense for the above four days was as follows: Railroad for witnesses, $7.62; hotel, $28; railroad and hotel for myself, $9; total, $44.62.)		
		.....	$157 99
February 9	Went to Syracuse to see J. N. Babcock	42	$1 34
15	Went to Oneida to see W. S. Leet	12	25
19	Went to Lakeport, Oneida lake	18	2 00
23	Went to Fulton, Oswego county, to consult district attorney	58	3 50
		.....	$165 48
March 3	Went to Sylvan beach, Oneida lake	18	.....
14	Went to Syracuse to attend court	44	$2 68
17	Went to Syracuse to court; took two witnesses	44	4 20
27	Went to Sylvan beach, Oneida lake	18	.....
		.....	$171 96
April 1	Went to Oneida lake to get steamboat ready to start for nets as soon as the ice should go out of the lake; worked on steamboat 2d, 4th, 5th, 6th, 7th, 9th, 11th, 12th, 13th, 14th, 15th, 16th, 18th, 19th, 20th, 21st, 22d, 24th, 25th, 26th, 27th and 28th	.....	.....
8	Went to Syracuse, Onondaga lake	44	$1 34
23	Went to Syracuse to see J. N Babcock	44	1 84
29	Went down Oneida lake after nets	30	3 00
30	Went to Syracuse and Onondaga lake	46	1 34
		.....	$178 98

THIRTEENTH DISTRICT — *(Continued).*

DATE.			No. of miles traveled.	Disbursements for travel, etc.
May	2	Went to South bay, Oneida lake	12	$1 50
	3	Went to Lakeport and Bridgeport, Oneida lake	58	4 25
	4	Stayed at Fish creek destroying nets	.....	1 00
	7	Went to South bay, Oneida lake	12	1 50
	9	Went down Oneida lake after nets	58	4 22
	10	Went down Oneida lake after nets	88	4 72
	11	Stayed at Fish creek destroying nets	.....	1 00
	12	Went home to Canastota	9	.....
	13	Went to Oneida	13	.....
	14	Went down to Oneida lake after nets	68	4 47
	15	Stayed at Fish creek destroying nets	.....	1 00
	16	Went down Oneida lake after nets	78	4 22
	17	Went to Albany on special order from commissioners	127	.....
	18	Went to St. Johnsville	64	.....
	19	Went to Schenectady and Albany	137	.....
	20	Went to St. Johnsville and to Canastota	130	.....
	21	Went to Syracuse to see Jesse Locke	44	2 04
	24	Went down Oneida lake after nets	.....	.....
	25	Came back from down the lake	78	4 72
			.....	$213 62
June	4	Went to Syracuse to see J. N. Babcock	42	$1 34
	10	Went to Lakeport and Bridgeport, Oneida lake	30	4 00
	20	Went down Oneida lake after nets	60	4 22
	29	Went to Lewis Point, Oneida lake	34	1 72
			.....	$224 90
July	5	Went from Sylvan beach to Canastota, in Lakeport cases	28	$1 30
	8	Went down Oneida lake after nets	50	3 50
	13	Went down Oneida lake after nets	60	3 50
			.....	$233 10
August	8	Went down Oneida lake after nets	50	$3 50
	22	Went down Oneida lake after nets	60	4 29
	23	Went to Skaneateles and Cayuga lakes	140	4 12
	31	Went to Taberg, Oneida county	35	4 25
			.....	$249 26
September	9	Went to Lewis Point, Oneida lake	22	$3 50
	10	Went down to Oneida lake after nets	60	5 04
	11	Got back from down the lake	.....	4 00
	15	Went down Oneida lake after nets	.....	.....
	17	Started for Oneida lake; got steamboat crushed by railroad bridge	22	.....
	19	Repairing steamboat	.....	.....
	21	Repairing steamboat	.....	.....
	22	Started for Oneida lake	12	2 50
	23	On Oneida lake hunting after nets	50	4 00
	24	On Oneida lake hunting nets	50	4 00
	25	Went to Bridgeport and Chittenango creek	45	4 50
	27	Stayed at home writing letters	.....	.....
	28	Went to Lakeport, Bridgeport and Lower South bay	50	4 50
	29	Went down Oneida lake after nets	.....	.....
	30	Got back from down the lake	60	6 60
			.....	$287 90

THIRTEENTH DISTRICT — *(Continued.)*

DATE.		No. of miles traveled.	Disbursements for travel, etc.
October 1	Went to Syracuse to see district attorney	42	$1 34
4	Went to Fish creek and return; to Bridgeport and return,	66	4 04
5	Went to Oneida, case of John Pendel	12	62
6	Went to Fish creek, Oneida lake	18	2 50
7	Went to Syracuse to court, Pomroy case	42	1 34
8	Worked on steamboat	.....	.....
9	Went to Bridgeport, McVicker case	30	3 50
10	Got back from Bridgeport; consulted lawyer	.....	.....
12	Attended justice court in case of May and Long	.....	.....
13	Went to Bridgeport; was out all night	30	3 50
14	Went to Oneida lake to fix steamboat	.....	.....
15	Got back from Oneida lake at 6 P. M.	18	3 75
16	Went to Oneida lake; out all night	15	.....
17	Got back from Oneida lake; left man on shore to watch	15	3 00
18	Went to Oneida lake 2 A. M.; was concealed on shore all day	20	3 00
19	Came back from Oneida lake; attended justice court and returned to the lake	20	2 00
20	Got back from the lake; attended justice court	20	3 00
21	Went to Bridgeport; arrested Michael and Lewis Pendel	30	3 75
22	Attended justice court in Pendel cases	.....	.....
23	Arrested Keller and McGrattan for Sunday hunting	30	.....
24	Attended justice court, case of Herman Downs	.....	.....
25	Attended justice court in Pendel cases	.....	.....
26	Went to Oneida lake to serve papers on Jay Winn	20	2 00
27	Worked on statement for commissioners	.....	.....
28	Went to meet Dr. Edgerton, case Sunday hunting	.....	.....
29	Went to Utica to see R. U. Sherman	76	2 40
30	Went to Lakeport and Bridgeport	36	3 25
		.....	$330 89
November 1	Made out report	.....	.....
2	Attended justice's court, case May and Long	.....	.....
3, 4, 5, 7	Was at Oneida take getting steamboat ready for winter	.....	.....
9	Made out vouchers for July, August and September	.....	.....
10	Went to Utica to see district attorney	66	$1 54
11	Went to Syracuse to see H. H. Scott	50	1 34
12	Went to Jordan, Onondaga county	.....	.....
13	Went to Cross lake, near Jordan; came home on 11.20 P. M. train	94	2 19
14	Sent out game law posters (postage)	.....	75
15	Worked on steamboat	.....	.....
16	Worked on steamboat	.....	.....
17	Went to Oneida	14	3 00
19	Went to Jordan, Onondaga county	.....	.....
20	Went from Jordan to Cross lake	.....	.....
21	Attended court at Jordan; case H. H. Reed, Josiah McIntire and Tom Bow	94	7 66
22	Went to Oswego to see S. B. Mead	84	2 72
23	Returned from Oswego	84	2 11
25	Went to Oneida to see Graham and others	12	74
28	Went to Jordan to attend justice court	80	2 76
		3,877	$355 70

Date.	NETS CAPTURED IN ONEIDA LAKE.	Number of nets captured.	Estimat'd value of nets destroyed.
1887.			
May 3	Trap nets, west of Shackleton's point	7	$280 00
9	Trap nets, east of Shackleton's point	5	200 00
10	Trap nets, east of Chittenango creek	5	200 00
10	Trap nets, in Pomroy's bay	2	80 00
10	Trap nets, in Muskrat bay	2	80 00
10	Trap nets, near Toad harbor	6	240 00
10	2,900 feet of gill net, Pomroy's bay	....	150 00
14	Trap nets, near Lakeport	4	160 00
14	Perch net, near Lakeport	1	1 50
16	Trap nets, at Toad harbor	5	200 00
16	Trap nets, near Brewerton	4	160 00
June 20	Trap nets, near Brewerton	3	120 00
20	Fyke net, near Brewerton	1	20 00
August 22	Trap nets, near Chittenango creek	1	40 00
22	Trap nets, in Dakin's bay	2	80 00
30	Trap nets, east of Chittenango creek	2	60 00
September 24	Trap nets, near Eel island	1	40 00
29	Trap nets, near Chittenango creek	3	120 00
October 23	Fyke nets, near South bay	1	10 00
November 20	Fyke nets, in Cross lake	8	160 00
		63	$3,201 50

1887. Used steamboat hunting nets, as follows:	Number of days.	Number of nets capt'rd.
April 29	1	..
May 3, 9, 10, 14, 16, 24, 25	7	41
June 20, 29	2	4
July 8, 13	2	0
August 8, 22, 30	3	5
September 10, 11, 15, 17, 22, 23, 24, 28	8	4
October 23	..	1
November 20	..	8
	23	63

November 29, 1887:

Number of nets captured in past year (2,900 feet of gill net)	63
Value of nets captured	$3,201 50
Miles traveled	3,877
Amount disbursed	$355 70
Used steamboat hunting nets (days)	23
Number of arrests caused to be made	7
Number of suits ordered	18
Suits discontinued	12
Suits now pending	14
Amount of fines and penalties imposed	$415 00

REMARKS.

I would respectfully beg the commission to excuse me from making remarks this year as it would simply be a repetition of what I said last year, there is no more change in the position than there is in the amount allowed the protectors for disbursements. I promised the people along the Seneca river that I would ask the commissioners why fish-ways were not put into the State dams along the Oswego and Seneca rivers and to make it a part of this report. I would ask that the commissioners make some recommendations in their report, as regards this matter.

WM. H. LINDLEY,
Game and Fish Protector, Thirteenth District.

CANASTOTA, MADISON CO., *December* 1, 1887.

JOHN SHERIDAN — FOURTEENTH DISTRICT.

To the Commissioners of Fisheries:

I would respectfully submit the following synopsis of my monthly reports for the year ending November 30, 1887:

Miles traveled, 11,863; traveling expenses paid, $257.24.

1886.		
December	4.	Seized 2 gill nets at Hammondsport on Lake Keuka.
	6.	Seized 1 gill net at Grove Spring on Lake Keuka.
	7.	Seized 3 gill nets at Urbana on Lake Keuka.
	10.	Seized 2 gill nets at Keuka on Lake Keuka.
	13.	Seized 1 gill net at Dresden on Seneca lake.
	15.	Seized 2 gill nets at Watkins on Seneca lake.
1887.		
January	19.	Seized 3 gill nets at Long Point on Seneca lake.
February	15.	Seized 4 gill nets on Cayuga lake.
March	1.	Seized 2 gill nets at Watkins on Seneca lake.
	4.	Seized 3 gill nets at Long Point on Seneca lake.
	7.	Seized 2 gill nets at Keuka on Lake Keuka.
	14.	Seized 2 gill nets at Branchport on Lake Keuka.
	15.	Seized 2 gill nets at Haddins Point on Lake Keuka.
April	2.	Seized 2 gill nets at Keuka on Lake Keuka.
	5.	Seized 3 gill nets at Branchport on Lake Keuka.
	7.	Seized 3 gill nets at Gibsons on Lake Keuka.
	12.	Seized 2 gill nets at Long Point on Seneca lake.
May	2.	Seized 1 gill net at Long Point on Seneca lake.
	4.	Seized 2 gill nets at Dresden on Seneca lake.

1887,

May 9. Seized 2 gill nets at Watkins on Seneca lake.
17. Seized 1 gill net at Keuka on Lake Keuka.
18. Seized 2 gill nets at Bluff Point on Lake Keuka.
June 1. Seized 2 gill nets at Branchport on Lake Keuka.
7. Seized 2 gill nets at Bending Oak on Lake Keuka.
8. Seized 2 gill nets at Haddins Point on Lake Keuka.
10. Seized 2 gill nets at Harts Point on Lake Keuka.
July 5. Seized 3 gill nets at Watkins on Seneca lake.
13. Seized 2 gill nets at Branchport on Lake Keuka.
14. Seized 2 gill nets at Gibsons on Lake Keuka.
18. Seized 3 gill nets at Hammondsport on Lake Keuka.
August 4. Seized 2 gill nets at Watkins on Seneca Lake.
8. Seized 3 gill nets at Dresden on Seneca lake.
15. Seized 2 gill nets on Little lake.
17. Seized 3 gill nets on Mud lake.
22. Seized 1 gill net at Branchport on Lake Keuka.
September 6. Seized 7 gill nets at Boyd's Landing on Lake Keuka.
8. Seized 2 gill nets at Hammondsport on Lake Keuka.
20. Seized 1 gill net at Long Point on Seneca lake.
26. Seized 1 gill net at Watkins on Seneca lake.
28. Seized 2 gill nets at Geneva on Seneca lake.
October 3. Seized 2 gill nets at Hammondsport on Lake Keuka.
10. Seized 3 gill nets at Branchport on Lake Keuka.
13. Seized 2 gill nets at Bluff Point on Lake Keuka.
November 2. Seized 3 gill nets at Two Mile Point on Lake Keuka.
15. Seized 2 gill nets at Hammondsport on Lake Keuka.
19. Seized 1 gill net at Gobles on Lake Keuka.
22. Seized 1 gill net at Two Mile Point on Lake Keuka.
24. Seized 5 gill nets at Haddins Point on Lake Keuka.
24. Seized 5 gill nets at Bending Oak on Lake Keuka.

All of which were destroyed. Value of same, $2,610.

October 17, 18 and 19, in compliance with orders from Commissioner Sherman, was at Little Sandy Pond with Protector G. M. Swartz, and we made a thorough search and cleared the pond of nets, seizing twelve trap nets; value, $700.

Floyd Nicholson was tried for violation of the game and fish laws in September, in the Supreme Court at Bath, Steuben county. Convicted and fined $125, and $150 costs; went to jail.

I have used a steamboat about fifty nights during the past year, which is not charged to the State.

November 22, 1887, arrested Adsit Bailey, Frank Evans, Phillip Foltz and John Layton for illegal fishing at Two Mile Point, on Lake

Keuka. Trial set down for November 29. Adjourned to December 8.

I would respectfully suggest the following changes in the laws:

Section 19 now reads: "No person shall at any time * * * molest or disturb, etc." Now, what constitutes such a molestation or disturbance of fish on their spawning beds as to come under this law should be so plainly defined that a quibbling jury, justice or judge can not make any mistake in its construction.

Section 24 now reads: "Or other device used in unlawful taking such fish," whereas it means, and should read, "or other device which may or can be used for the purpose of unlawfully taking such fish." As it now stands, it gives a jury or court, that is at all inclined to side with the defendant, a chance to say that persons must be caught in the act of using those devices in order to secure any conviction. It seems to me that such a defect should be remedied.

Section 33, as it now stands, after a suit has been commenced in a court of record or any other court by the game protector, a purely bogus suit, even at the instigation and with the collusion of the defendant, may be put in judgment, which, as the law now reads, "may," not "must," be collected; and said judgment thus procured may be pleaded in bar in the suit by the game protector, if it relates to the same time or circumstance.

It has been done in Steuben county, the suit by the game protector being prosecuted by my predecessor, Aaron Parish, and he being beaten on that point only, in the trial court. The appellate court, during my term, has affirmed the said verdict on that same point.

It is readily seen the difficulty besetting an officer under, such construction of the law; therefore, I think, the law should be so framed that such things would be effectually stopped, and no such loop-holes left by which any legal quibble would enable any guilty man to escape.

Also, in the same section, it should be so worded that if the district attorney shall be unable or unwilling, for any reason or from any cause, to try the case, that the game protector can employ counsel, and the compensation therefor, at an amount certified by the game protector, shall be a charge upon the county wherein the offense has been committed, to be levied and collected as other county charges are levied and collected.

I suggest this, as the game protector had to force the district attorney to do his duty in the case spoken of, and you can readily see how it would prove a very heavy drag, if he, for any cause, did not heartily enter into the spirit of the suit, or did not take hold of it as a good,

honest lawyer should. I have also had the same difficulty, whereas if I had been at liberty to employ (and see that he was properly paid) other counsel, the result would have been different. The remedy of punishing any lax official, of whatever office he may be the occupant, should be even more strict than it is at present. I suggest that the amount be certified by the game protector, so that boards of supervisors could not haggle over the bill in any way.

Section 34 should have an additional paragraph, embodying the general law, that a criminal prosecution for any offense against this act shall in no wise and in no event be a bar to any prosecution for a penalty thereunder. Simply so that all the game law with all its consequences shall be together.

Sections 35 and 39 should be so worded that a warrant could be issued by a justice, etc., in any adjoining county to the one in which the offense was committed, or it may be tried before any justice, etc., in any adjoining county to the one in which the arrest was made.

I have a case in point now. It is very hard to secure any conviction in Steuben county for any violation of the game law relative to fishing on Lake Keuka, and if I could bring it into Yates county I could get more justice done me.

In section 35 it should also be so worded that when suit is brought in an adjoining county the costs, if not recovered of the defendant, should be a charge upon the county wherein the offense was committed or the arrest was made, to be levied and collected as other county charges are levied and collected, and the part of the fine belonging to the county treasurer, after reimbursing the county or town wherein the trial was had, should go to the county treasurer of the county wherein the offense was committed or the arrest was made.

Section 41; in this section the words "set line" should be stricken out. How can you tell what they are catching unless you watch them all the time. It is utterly impossible to afford protection to fish caught in this way except in the closed season, and you will see by my report the amount of them I have destroyed on trout beds, and there is no doubt but that very many of them escaped my vigilance. The only safe way, if the fish are to be protected at all, is to blot it out entirely, and all true sportsmen here want it done. Those who want it left are those who try in every way to evade the law, and catch fish regardless of the law. I do hope it will be erased at once and forever.

Chapter 620 of the Laws of 1887 should be repealed. It is essentially and radically bad. How is any game protector to draw any

line and know, at all times, whether the fish are caught on the one side or upon the other of said line. It is simply impossible.

Special game law legislation is greatly to be deprecated. It only makes it so much the harder to enforce, and in some instances, as in the two last cited, it is absolutely impossible to properly enforce them.

I have taken the liberty of making these suggestions, as I was invited to make them in regard to any defects that I had seen, and also because I am very desirous of seeing the law so that it can be enforced by any game protector. Hoping these suggestions may be of some benefit and of some help in bringing about these much-needed changes, I certify that the foregoing report is correct and true.

JOHN SHERIDAN,

Fish and Game Protector, Fourteenth District.

PENN YAN, N. Y., *December* 1, 1887.

GEORGE M. SCHWARTZ — FIFTEENTH DISTRICT.

Itemized report for the year ended November 30, 1887.

Date.	LOCATION.	Miles traveled.	Nets captured.	Value of nets destroyed.	Arrests.	Convictions.	Amount recovered.	Expenses.
1886.								
Dec. 1, 2	Sodus bay	161	2 gill	$40 00	....	....	.....	$21 71
3	At Rochester	.....	.....	.....	....	....	.....	.....
4	Braddock's bay	38	.....	.....	....	....	.....	5 00
5	Sunday	.....	.....	.....	....	....	.....	.....
6	Irondequoit bay	14	.....	.....	....	....	.....	5 00
7	Parma Corners	24	.....	.....	....	....	.....	5 00
8	Irondequoit bay	14	.....	.....	....	....	.....	5 00
9	Irondequoit bay	14	2 fykes	20 00	....	....	.....	5 00
10	At Rochester	.....	.....	.....	....	....	.....	.....
11	Pittsford	18	1 fyke	9 00	....	....	.....	6 50
12	Sunday	.....	.....	.....	....	....	.....	.....
13	At Rochester	.....	.....	.....	....	....	.....	.....
14	Irondequoit bay and Webster	24	1 fyke	11 00	....	....	.....	9 00
15	At Rochester	.....	.....	.....	....	....	.....	.....
16	At Rochester	.....	.....	.....	....	....	.....	.....
17	Spencerport	22	.....	.....	....	....	.....	5 00
18	Lyons and Clyde	86	.....	.....	....	....	.....	2 16
19	Sunday	.....	.....	.....	....	....	.....	.....
20	At Rochester	.....	.....	.....	....	....	.....	.....
21	Long pond	28	.....	.....	....	....	.....	5 00
22	Webster and Irondequoit bay	24	1 fyke	15 00	....	....	.....	9 00
23	Webster and Irondequoit bay	24	1 seine	30 00	....	....	.....	9 00
24	Webster and Irondequoit bay	24	1 fyke	11 00	....	....	.....	9 00
25	At Rochester	.....	.....	.....	....	....	.....	.....
26	Sunday	.....	.....	.....	....	....	.....	.....
27	Float bridge	16	.....	.....	....	....	.....	5 00
28	Braddock's bay and Long pond	42	2 fykes	20 00	....	....	.....	9 50
29	Wide waters	12	.....	.....	....	....	.....	5 00
30	Genesee river (Charlotte)	14	1 fyke	10 00	....	....	.....	7 00
1887.								
Jan. 1	Genesee river	14	1 fyke	9 00	....	....	.....	7 00
2	Sunday	.....	.....	.....	....	....	.....	.....
3	Irondequoit bay	14	.....	.....	....	....	.....	5 00
4	Hemlock and Honeoye lakes	80	.....	.....	....	....	.....	6 00
5	At Rochester	.....	.....	.....	....	....	.....	.....
6	Sandy & Salm'n creeks	70	1 fyke	10 00	....	....	.....	10 25
7	At Rochester	.....	.....	.....	....	....	.....	.....
8	Float bridge	12	.....	.....	....	....	.....	5 00
9	Sunday	.....	.....	.....	....	....	.....	.....
10	Buck pond	28	1 fyke	10 00	....	....	.....	9 50
11	Long pond	28	2 fykes	18 0	....	....	.....	9 50
12	Webster and Irondequoit bay	40	.....	.....	....	....	.....	9 00
13	Webster and Irondequoit bay	40	1 seine	75 00	....	....	.....	9 00
14	At Rochester, trial of S. Goldstein and A. Arensteine	.....	.....	.....	2	2	$50 00	.....
15	Float bridge	12	.....	.....	....	....	.....	5
16	Sunday	.....	.....	.....	....	....	.....	.....
17	At Rochester	.....	.....	.....	....	....	.....	.....
18	Irondequoit bay	14	1 seine and 2 fykes	75 00	....	....	.....	6 75
19	At Rochester	.....	.....	.....	....	....	.....	.....
20	Lond pond	28	1 fyke	10 00	....	....	.....	9 50
21	At Rochester	.....	.....	.....	....	....	.....	.....
22	Long pond	28	1 fyke	10 00	....	....	.....	9 50
23	Sunday	.....	.....	.....	....	....	.....	.....

FIFTEENTH DISTRICT — *(Continued).*

Date.	LOCATION.	Miles traveled.	Nets captured.	Value of nets destroyed.	Arrests.	Convictions.	Amount recovered.	Expenses.
1887.								
Jan. 24	At Rochester	.....	.....	.....	....	....	.....	.....
25	At Rochester	.....	.....	.....	....	....	.....	.....
26	At Rochester	.....	.....	.....	....	....	.....	.....
27	At Rochester	.....	.....	.....	....	....	.....	.....
28	At Rochester	.....	.....	.....	....	....	.....	.....
29	At Rochester	.....	.....	.....	....	....	.....	.....
30	Sunday	.....	.....	.....	....	....	.....	.....
31	At Rochester	.....	.....	.....	....	....	.....	.....
Feb. 1	At Rochester	.....	.....	.....	....	....	.....	.....
2	At Rochester	.....	.....	.....	....	....	.....	.....
3	At Rochester	.....	.....	.....	....	....	.....	.....
4	At Rochester	.....	.....	.....	....	....	.....	.....
5	At Rochester	.....	.....	.....	....	....	.....	.....
6	Sunday	.....	.....	.....	....	....	.....	.....
7	At Rochester	.....	.....	.....	....	....	.....	.....
8	At Rochester	.....	.....	.....	....	....	.....	.....
9	At Rochester	.....	.....	.....	....	....	.....	.....
10	At Rochester	.....	.....	.....	....	....	.....	.....
11	At Rochester	.....	.....	.....	....	....	.....	.....
12	At Rochester	.....	.....	.....	....	....	.....	.....
13	Sunday	.....	.....	.....	....	....	.....	.....
14	At Rochester	.....	.....	.....	....	....	.....	.....
15	At Rochester	.....	.....	.....	....	....	.....	.....
16	Webster	40	2 fykes	$22 00	....	....	.....	$9 00
17	Webster and Irondequoit bay	40	.....	.....	....	....	.....	7 00
18	At Rochester	.....	.....	.....	....	....	.....	.....
19	Float bridge	14	.....	.....	....	....	.....	5 00
20	Sunday	.....	.....	.....	....	....	.....	.....
21	Lyons, as witness in case of illegal fishing	72	.....	.....	....	....	.....	2 50
22	Went to Albany with reference to law concerning game protectors	454	.....	.....	....	....	.....	15 00
23	At Albany	.....	.....	.....	....	....	.....	.....
24	At Albany	.....	.....	.....	....	....	.....	.....
25	Lyons, trial of Robert Beader, Sup. Court	72	.....	.....	....	....	.....	4 00
26	Webster and Irondequoit bay	40	1 fyke	10 00	....	....	.....	9 00
27	Sunday	.....	.....	.....	....	....	.....	.....
28	At Rochester	.....	.....	.....	....	....	.....	.....
Mar. 1	Long pond	28	.....	.....	....	....	.....	5 00
2	Dugway and Penfield	26	1 seine	20 00	....	....	.....	9 00
3	Long pond	28	.....	.....	....	....	.....	5 00
4	Irondequoit bay	14	.....	.....	....	....	.....	5 00
5	At Rochester	.....	.....	.....	....	....	.....	.....
6	Sunday	.....	.....	.....	....	....	.....	.....
7	Irondequoit bay	14	2 fykes	20 00	....	....	.....	7 00
8	At Rochester	.....	.....	.....	....	....	.....	.....
9	Long pond	28	2 fykes	20 00	....	....	.....	9 00
10	Irondequoit bay	14	.....	.....	....	....	.....	5 00
11	Irondequoit bay	14	.....	.....	....	....	.....	5 00
12	At Rochester	.....	.....	.....	....	....	.....	.....
13	Sunday	.....	.....	.....	....	....	.....	.....
14	Webster and Irondequoit bay	26	.....	.....	....	....	.....	5 00
15	Lyons, Wayne county, to attend trial	72	.....	.....	....	....	.....	2 50
16	Spencerport	22	.....	.....	....	....	.....	5 00
17	Dugway	7	.....	.....	....	....	.....	5 00
18	Long pond	28	1 fyke	11 00	....	....	.....	9 00
19	Genesee river, Charlotte	14	1 fyke	18 00	....	....	.....	9 00
20	Sunday	.....	.....	.....	....	....	.....	.....
21	Irondequoit bay	14	2 fykes	22 00	....	....	.....	9 00
22	At Rochester	.....	.....	.....	....	....	.....	.....
23	Long pond	28	2 fykes	18 00	....	....	.....	9 50

FIFTEENTH DISTRICT — *(Continued).*

Date.	LOCATION.	Miles traveled.	Nets captured.	Value of nets destroyed.	Arrests.	Convictions.	Amount recovered.	Expenses.
1887.								
Mar. 24	At Rochester	.....	.....	.....	....	....	.....	.....
25	Braddock's bay	38	.....	.....	....	....	.....	$5 00
26	Wide Waters	14	.....	.....	....	....	.....	5 00
27	Sunday	.....	.....	.....	....	....	.....	.....
28, 29	Braddock's bay	38	2 fykes	$30 00	....	....	.....	18 00
30	At Rochester	.....	.....	.....	....	....	.....	.....
31	At Rochester	.....	.....	.....	....	....	.....	.....
April 1	Pittsford	16	.....	.....	....	....	.....	5 00
2	Wide Waters	14	.....	.....	....	....	.....	5 00
3	Sunday	.....	.....	.....	....	....	.....	.....
4	Irondequoit bay	14	.....	.....	....	....	.....	5 00
5	Wide Waters	14	.....	.....	....	....	.....	5 00
6	Wide Waters	14	.....	.....	...	....	.....	5 00
7, 8	Blind Sodus bay	166	1 seine	75 00	....	....	.....	15 93
9	Long pond	28	1 gill	20 00	....	....	.....	9 75
10	Sunday	...	.....	.....	....	....	.....	.....
11	Wide Waters	14	.....	.....	....	....	.....	5 00
12	Wide Waters	14	.....	.....	....	....	.....	5 00
13	At Rochester	.....	.....	.....	....	....	.....	.....
14	Wide Waters	14	1 seine	25 00	....	....	.....	5 00
15	Long pond	28	1 fyke	10 00	....	....	.....	9 75
16	At Rochester	.....	.....	.....	....	....	.....	.....
17	Sunday	.....	.....	.....	....	....	.....	.....
18	Braddock's bay	38	2 fykes	20 00	....	....	.....	9 75
19	Irondequoit bay	14	.....	.....	....	....	.....	5 00
20	Wide Waters	14	.....	.....	....	....	.....	5 00
21	Long pond	28	.....	.....	....	....	.....	5 00
22	Irondequoit bay	14	.....	.....	....	....	.....	5 00
23	Buck pond	30	6 fykes	50 00	....	....	.....	10 25
24	Sunday	.....	.....	.....	....	....	.....	.....
25	Town of Greece; trial of four offenders; fined $5 each	.....	.....	.....	4	4	$20 00	.....
26	Long pond	28	1 fyke	8 00	....	....	.....	9 75
27, 28	Blind Sodus bay	166	1 trap	75 00	....	....	.....	16 46
29	Greece, to attend trial,	.....	.....	.....	1	1	5 00	.....
30	Braddock's bay	28	2 fykes	20 00	....	....	.....	9 75
May 1	Sunday	.....	.....	.....	....	....	.....	.....
2	Irondequoit bay	14	1 fyke	8 00	....	....	.....	7 50
3	Buck pond	30	3 fykes	30 00	....	....	.....	19 75
4, 5, 6	Sodus point	104	1 trap	75 00	....	....	.....	18 50
7	Braddock's bay	38	2 fykes	18 00	...	....	.....	9 75
8	Sunday	.....	.....	.....	....	....	.....	.....
9, 10	Sandy creek	62	6 fykes	62 00	....	....	.....	19 50
11, 12	Irondequoit bay	14	8 gill	125 00	....	....	.....	12 00
13	Genesee river; suits brought against two for illegal fishing	14	3 fykes	30 00	....	....	.....	7 25
14	Irondequoit bay	14	2 gill	25 00	....	...	.....	7 00
15	Sunday	.....	.....	.....	....	....	.....	.....
16	Genesee river	14	.....	.....	....	....	.....	5 00
17–20	Seneca river and Clyde river	218	37 fy, 1 sn'e,	400 00	....	....	.....	35 00
21	Irondequoit bay	14	.....	.....	....	....	.....	5 00
22	Sunday	.....	.....	.....	....	....	.....	.....
23	Braddock's bay	38	3 fykes	30 00	....	....	.....	10 25
24	At Rochester	.....	.....	.....	....	....	.....	.....
25	At Rochester	.....	.....	.....	....	....	.....	.....
26	Round, Long and Cranberry ponds	40	2 fykes	17 00	....	....	.....	10 75
27	Irondequoit bay	14	.....	.....	....	....	.....	5 00
28	Genesee river	14	.....	.....	....	....	.....	5 00
29	Sunday	.....	.....	.....	....	....	.....	.....
30	Decoration day	.....	.....	.....	....	....	.....	.....
31	Greece; trial of offenders	14	.....	.....	....	....	.....	5 00
June 1	Long pond	28	.....	.....	....	....	.....	5 00
2	At Rochester	.....	.....	.....	....	....	.....	.....
3	Genesee river	14	.....	.....	....	....	.....	5 00

FIFTEENTH DISTRICT—*(Continued).*

Date.	LOCATION.	Miles traveled.	Nets captured.	Value of nets destroyed.	Arrests.	Convictions.	Amount recovered.	Expenses.
1887.								
June 4	Parma Corners	26						$5 00
5	Sunday							
6	Lyons, grand jury	86						5 50
7	Genesee river	14						5 00
8	Irondequoit bay	14						5 00
9	At Rochester							
10	Braddock's bay	38	3 fykes	$30 00				10 50
11	Greece	10						3 00
12	Sunday							
13	Lyons, in court	72						4 50
14, 15	Seneca river	165						25 50
16	Irondequoit bay	14						5 00
17	Irondequoit bay	14						5 00
18	At Rochester							
19	Sunday							
20	Long pond	28						5 00
21	Braddock's bay	38	3 fykes	25 00				10 00
22	At Rochester							
23	Irondequoit bay	14						5 00
24, 25	Conesus lake	80						6 00
26	Sunday							
27, 28	Braddock's bay	38						10 00
29	At Rochester							
30	At Rochester							
July 1	Braddock's bay	38	1 gill, 1 fyke	25 00				10 75
2	At Rochester							
3	Sunday							
4	At Rochester							
5	Long pond	28						5 00
6	At Rochester							
7	At Rochester							
8	Long pond	28	2 fykes	18 00				10 75
9	Irondequoit bay	14						5 00
10	Sunday							
11	At Rochester							
12	Greece	18						4 00
13	Braddock's bay	38	2 fykes	18 00				10 75
14	Hemlock lake	78						12 62
15, 16	Rifle range	24						6 00
17	Sunday							
18	At Rochester							
19	At Rochester							
20, 21	Braddock's bay	38	1 gill, 3 fyk's	30 00				18 50
22	Irondequoit bay	14						5 00
23	At Rochester							
24	Sunday							
25	Black creek	16						3 00
26	At Rochester							
27	Braddock's bay	38	2 fykes	18 00				10 25
28, 29	Conesus lake	60						10 00
30	At Rochester							
31	Sunday							
Aug. 1	Braddock's bay	38						5 00
2	Irondequoit bay	14						5 00
3	Braddock's bay	38	2 fykes	25 00				10 25
4	Long pond	28						5 00
5	Genesee river	14						5 00
6	At Rochester							
7	Sunday							
8	Irondequoit bay	14						5 00
9	Genesee river	18						1 00
10	Lyons	72						2 50
11	Braddock's bay	38	3 fykes	25 00				9 75
12	Charlotte	14	2 fykes	20 00				7 75
13	At Rochester							
14	Sunday							
15	At Rochester							
16	Irondequoit bay	14						5 00
17	Genesee river	14						5 00

FIFTEENTH DISTRICT — *(Continued).*

Date.	LOCATION.	Miles traveled.	Nets captured.	Value of nets destroyed.	Arrests.	Convictions.	Amount recovered.	Expenses.
1887.								
Aug. 18	Braddock's bay	38	1 fyke	$12 00	....	....	.....	$10 25
19	Genesee river	14	.....	.....	....	....	.....	5 00
20	Wide waters	14	.....	.....	....	....	.....	3 00
21	Sunday	.....	.....	.....	....	....	.....	.....
22	Irondequoit bay	14	.....	.....	....	....	.....	5 00
23	Buck and Cranberry ponds	30	1 fyke	10 00	....	....	.....	9 50
24	Long pond and Braddock's	40	1 fyke	10 00	....	....	.....	9 75
25	Rochester	.....	.....	.....	....	....	.....	.....
26	Wide waters	14	.....	.....	....	....	.....	5 00
27	Genesee river	20	.....	.....	....	....	.....	5 00
28	Sunday	.....	.....	.....	....	....	.....	.....
29	Genesee river	18	1 fyke	12 00	....	....	.....	7 75
30	Forrest House	10	.....	.....	....	....	.....	3 00
31	Long pond	28	1 gill	25 00	1	1	$5 00	9 75
Sept. 1, 2	Forrest House, attending suit	.....	.....	.....	....	....	.....	.....
3	At Rochester	.....	.....	.....	....	....	.....	.....
4	Sunday	.....	.....	.....	....	....	.....	.....
5	Lyons, attending trial	72	.....	.....	2	2	85 00	6 00
6	Irondequoit bay	14	.....	.....	....	....	.....	5 00
7	Dugway	14	.....	.....	....	....	.....	5 00
8	Rochester	.....	.....	.....	....	....	.....	.....
9	Long pond	30	2 fykes	20 00	....	....	.....	10 25
10	Rochester	.....	.....	.....	....	....	.....	.....
11	Sunday	.....	.....	.....	....	....	.....	.....
12	Wide waters	14	.....	.....	....	....	.....	3 00
13	Rochester	.....	.....	.....	....	....	.....	.....
14	Dugway	22	.....	.....	....	....	.....	5 00
15	Irondequoit	14	.....	.....	....	....	.....	5 00
16	Braddock's bay	38	3 fykes	30 00	....	....	.....	10 25
17	At Rochester	.....	.....	.....	....	....	.....	.....
18	Sunday	.....	.....	.....	....	....	.....	.....
19	Wide waters	14	.....	.....	....	....	.....	3 00
20	Dugway	22	.....	.....	....	....	.....	5 00
21	Cranberry and Long pond	30	1 fyke	12 00	....	....	.....	10 75
22	Dugway	22	.....	.....	....	....	.....	5 00
23	Irondequoit bay	14	.....	.....	....	....	.....	5 00
24	At Rochester	.....	.....	.....	....	....	.....	.....
25	Sunday	.....	.....	.....	....	....	.....	.....
26	Wide waters	14	.....	.....	....	....	.....	3 00
27	Wide waters	14	.....	.....	....	....	.....	3 00
28	Long pond	28	2 fyk's, 1 gill	35 00	....	....	.....	11 25
29	Wide waters	14	1 gill	20 00	....	....	.....	6 50
30	Rochester	.....	.....	.....	....	....	.....	.....
Oct. 1	Fairport	22	.....	.....	....	....	.....	3 00
2	Sunday	.....	.....	.....	....	....	.....	.....
3	At Rochester	.....	.....	.....	....	....	.....	.....
4, 5	Irondequoit bay	28	.....	.....	....	....	.....	6 00
6	Genesee river	7	.....	.....	....	....	.....	3 00
7	Braddock's bay	38	2 fyke	18 00	....	....	.....	10 25
8	Wide waters	14	.....	.....	....	....	.....	4 00
9	Sunday	.....	.....	.....	....	....	.....	.....
10	Wide waters	14	.....	.....	....	....	.....	4 00
11	Irondequoit bay	14	.....	.....	....	....	.....	5 00
12	Penfield	16	.....	.....	....	....	.....	4 00
13	At Rochester	.....	.....	.....	....	....	.....	.....
14	Long pond	28	1 fyke	10 00	....	....	.....	10 25
15	Wide waters	14	.....	.....	....	....	.....	4 00
16	Sunday	.....	.....	.....	....	....	.....	.....
17, 18, 19	Little Sandy pond	300	12 traps	700 00 or more			.....	15 00
20	At Rochester	.....	.....	.....	....	....	.....	.....
21	At Rochester	.....	.....	.....	....	....	.....	.....
22	At Rochester	.....	.....	.....	....	....	.....	.....
23	Sunday	.....	.....	.....	....	....	.....	.....
24	Irondequoit bay	14	.....	.....	....	....	.....	5 00
25	Wide waters	14	.....	.....	....	....	.....	4 00

FIFTEENTH DISTRICT — *(Concluded).*

Date.	LOCATION.	Miles traveled.	Nets captured.	Value of nets destroyed.	Arrests.	Convictions.	Amount recovered.	Expenses.
1887.								
Oct. 26	Rifle range	12	.....	.....	....	....	.....	$3 00
27	Round pond	17	.....	.....	....	....	.....	5 00
Nov. 1	Wide waters	14	.....	.....	....	....	.....	4 00
2	Irondequoit bay	14	.....	.....	....	....	.....	5 00
3	Cranberry pond	30	1 gill	$20 00	1	1	$10 00	9 75
4	Town of Greece, at trial	12	.....	.....	....	....	.....	2 00
5	Irondequoit bay	14	3 seine, fyke	75 00	....	....	.....	6 50
6	Sunday	.....	.....	.....	....	....	.....	.....
7	Irondequoit bay	14	4 gill	80 00	2	2	10 00	6 50
8	At Rochester	.....	.....	.....	....	....	.....	.....
9	Irondequoit, in court	10	.....	.....	....	....	.....	2 00
10	Irondequoit bay	14	.....	.....	....	....	.....	5 00
11	Wide waters	14	.....	.....	....	....	.....	4 00
12	Long pond	28	.....	.....	....	....	.....	5 00
13	Sunday	.....	.....	.....	....	....	.....	.....
14	Braddock's bay	38	3 fyke, gill	40 00	2	2	25 00	10 25
15	Greece, in court	12	.....	.....	....	....	.....	2 00
16	Irondequoit bay	14	.....	.....	....	....	.....	5 00
17 18 19	At Auburn on Owasco lake.	200	.....	.....	....	....	.....	10 00
20	Sunday	.....	.....	.....	....	....	.....	.....
21	Irondequoit bay	14	.....	.....	....	....	.....	5 00
22	Wide waters	14	.....	.....	....	....	.....	4 00
23	Long pond	28	5 fykes	50 00	....	....	.....	10 25
24	Thanksgiving Day	.....	.....	.....	....	....	.....	.....
25	Webster and Irondequoit bay	24	.....	.....	....	....	.....	5 00
26	Irondequoit bay	14	.....	.....	....	....	.....	5 00
28	Wide waters and Irondequoit bay	28	1 seine	100 00	....	....	.....	9 00
29	Wide waters	14	.....	.....	....	....	.....	3 00
30	Long pond	28	.....	.....	....	....	.....	5 00
	Totals	6,683	193	$3,188	18	18	$265 00	$1,417 63

RECAPITULATION.

Days employed	320
Miles traveled	683
Nets seized and destroyed	196
Value of nets destroyed	$3,188 00
Arrests	18
Convictions	18
Amount recovered	$265 00
Actions pending	6
Expenses	$1,417 63

REMARKS.

The fishing in waters in my district, which comprises seven counties, never was better than it is now. I have some of the best fishing grounds that are in the State. The fishing has improved wonderfully;

ten years ago you could very rarely catch a pickerel weighing more than three pounds. Now you can go most any day to the most prominent waters in my district and see them caught weighing from five to ten pounds. I have seen some taken out of Irondequoit and Braddock's bays that weighed sixteen pounds. The black bass fishing is better now than it has ever been; they are plenty and of good size. I have protected three counties out of my district, and the sporting men tell me that fishing never was better than now. The season for black bass is a little too short to allow them to get through spawning. Their closed time now is up to the first day of June, and it ought to be the first of July, as I have seen bass full of spawn on the tenth of June. I think that the pickerel ought to have protection in their spawning season, as there is no more game fish than the pickerel that swims in our waters. I should hope that a law would be passed to protect them in their spawning season, which is from the first of January to the first of May.

Game is not very plentiful in my district; that is, I mean large game. Woodcock are very plenty in and about Monroe county. The sporting men had quite a good day's sport on the first of the open season. I know personally that two friends of mine killed thirty-eight birds in a swamp, about two and a half miles from Rochester, on the first day of August Now I think that is pretty good gunning. Partridges are plenty to what they have been. That ought to show that protection to the birds has done some good.

Rabbits or hare are very plenty, but the law in regard to them ought to be changed as to ferret hunting. The law gives the landowner the right of allowing hunters to use a ferret on their grounds, so, if they get permission, we can not touch them. I have met gunners with their ferrets hunting. If you ask them they will tell you they have got permission; by the time we can find out whether or not it is true they will be gone, rabbits, ferrets and all.

In regard to the illegal fishermen I have got them pretty well broken up; that is, I mean the regular fishermen that made a living by it. They could not afford to replace their nets more than two or three times, as the most of them are very poor. There is a set of farmers that trouble me very much now. They live near the waters and most all of them have nets. If I catch them in the act of fishing they are willing to stand suit, and if I bring them before a country justice he will fine them from five to twenty-five dollars, and they are willing to pay the fines, as they can make up the amount in one night. In most all cases they are on friendly terms with the justices, who let them off very lightly. Now, I think the law ought to be

changed to imprisonment only, as half of the money collected for fines goes to the protector and that does not amount to much after the expenses are paid out of it.

There is a good chance for more work to be done, but the expenses allowed are not sufficient to allow a man to travel all the time, as you can see by my report that my expense account overbalances my salary and allowance, and if I were to depend upon my salary and expense allowance I could not do half of the work accomplished. Now, I think the commission ought to look into the matter and allow a man more for expenses. I have a plan and I think it would be a good idea. If the protectors would have a meeting with the commission and relate their experiences, I think that some of us would derive a great benefit from the conference.

GEO. M. SCHWARTZ,
Game and Fish Protector, Fifteenth District.

ROCHESTER, N. Y., *December* 1, 1887.

STEPHEN A. ROBERTS — SIXTEENTH DISTRICT.

To the Commissioners of Fisheries:

I submit the following summary of my work for past year, ended November 30, 1887. Miles traveled, 4,741, not including walking trips; traveling expenses, $199.53.

November 12, 1886.— Seized and cut up one gill net 200 feet in length, worth $15, in Scajaquada creek, Erie county.

December 1.— B. D. Rogers & Sons, of Buffalo, had on sale eight deer and three saddles of venison. Recovered penalty of fifty dollars and three dollars and eighty-five cents costs, for transporting deer contrary to law.

January 15, 1887.— Recovered from A. Bieneman, of Buffalo, fifteen dollars and four dollars and eighty cents costs, having on sale wild bird skins.

January 22.— Got judgment against Hamilton and McCracken, of Buffalo, wild bird skins on sale, for ten dollars and four dollars and eighty cents costs. They appealed to County Court, where the case rests.

April 3.— Received order from Superintendent Seth Green to go to Silver lake, Wyoming county. I went on April fourth, the ice was then broken up. I was given the names of seven persons who had been spearing pickerel through the ice. I gave their names, with the

names of three respectable witnesses, to District Attorney E. M. Bartlett, of Wyoming county, but to date he has done nothing in the matter that I have heard of.

May 14.— Near Sawyer's creek, Niagara county, I seized and cut up one fyke net, worth ten dollars.

May 21.— On shore of Lake Erie I seized and cut to pieces one seine 280 feet long, worth fifty dollars.

June 29.— Near Fort Niagara, Niagara county, Lake Ontario, seized and cut up one gill net 900 feet long, worth thirty dollars.

July 19.— Ordered suit against John and George Wagner, of Youngstown, Niagara county. The witnesses were soldiers, and were ordered west, so the suit dropped.

August 25.— On shore of Niagara river, Erie county, I seized five fyke nets, which were cut to pieces, worth fifteen dollars each.

September 12.— Went before grand jury, Niagara county, at Lockport, against J. W. Gillett, fishing with trap net. I saw him take the fish out of net but he was not indicted.

October 25.— Seized and cut to pieces two fyke nets on shore Niagara river, Grand Island ferry, Erie county, worth ten dollars each.

November 11.— Seized and cut to pieces one seine worth ten dollars on shore Niagara river near Tonawanda, Erie county.

Last winter I drew up and had printed, and through the kindness of Mr. F. M. Geise, assemblyman from this city, had passed an amendment to section 21 of the game laws, prohibiting the catching, or having in possession in Erie county, of black or Oswego bass, or muscalonge, between January first and July first. This will be a great help to me, as bass and muscalonge do not leave their spawning beds before the last of June, and then the weeds are so grown that nets can not be drawn. The current of Niagara river draws the ice to this end of the lake, and it remains here until it is all melted.

I constantly patrol suspected localities, and think the game laws are better observed than formerly, but it would be necessary to have a steam yacht, at least one month in the spring each year, to put an entire stop to poaching in Lake Erie and Niagara river. Last year I ordered five suits against parties in Cattaraugus county, but the district attorney has done nothing in these cases.

It is too bad that we can not get a plain and easily understood game law. As it is now, it is almost impossible, even for lawyers, to understand it.

S. A. ROBERTS,

Game and Fish Protector, Sixteenth District.

BUFFALO, ERIE COUNTY, *December* 1, 1887.

OFFICIAL PROCEEDINGS OF THE BOARD OF COMMISSIONERS OF FISHERIES.

At a special meeting of the Board, duly called and held in the Capitol, in the city of Albany, on Wednesday, March 22, 1887; all the commissioners being present.

On motion of Commissioner Sherman, it was

Resolved, That Superintendent Seth Green, in charge of the expenditure of the appropriation made by the commission for the purposes of the Fulton Chain hatchery, be authorized in his discretion and with the consent of the owners of such hatchery, to remove the hatchery building to a site to be selected by him on lands owned by the State, or to be conveyed to the State by the owners, and to expend in such work a sum not exceeding $150, payable out of the appropriation above stated.

On motion of Commissioner Sherman, it was

Resolved, That the superintendent of the Adirondack hatchery be authorized to erect a barn on the hatchery premises, at a cost not exceeding $250, payable out of the general appropriation applicable to the purposes of the commission.

On motion of Commissioner Blackford the following resolution was adopted and the secretary directed to forward copies thereof to the presiding officers of the two Houses of the Legislature:

WHEREAS, A bill has been introduced by the Hon. Daniel Finn and passed by the Assembly, to repeal an act of the Legislature of 1880, for the protection of lobsters, and

WHEREAS, The same necessity exists to-day as then for this protection, therefore be it

Resolved, That the Commissioners of Fisheries do respectfully protest against the repeal of this law, and that a copy of this resolution be forwarded to the chairman of the Senate and Assembly Committees on Game Laws.

Adjourned.

At a meeting of the Board held at the office of its president, 120 Broadway, New York, on Monday, July 25, 1887; all the commissioners being present.

On motion of Commissioner Bowman, it was

Resolved, That No. 120 Broadway, New York, be designated as the place and July 25, 1887, 2 o'clock P. M. as the time for the meeting of the Commissioners of Fisheries, to take action under the provisions of chapter 584, Laws of 1887.

An official opinion of Attorney-General O'Brien as to the status of the additional commissioner, Mr. A. Sylvester Joline, was read, accepted and ordered to be recorded in the minute book.

On motion of Commissioner Sherman, it was

Resolved, That the hatchery directed by chapter 293, Laws of 1887, to be erected at Mill creek, a tributary of Round lake, in Hamilton county, be located at such point on said stream, on lands belonging to to the State, in the town of Lake Pleasant, as shall be selected after personal examination by Superintendent Seth Green of the Caledonia hatchery, with the approval of a majority of the commissioners; and that the said superintendent be directed to proceed immediately to Lake Pleasant and make the necessary examinations touching said site, and that he be further authorized to prepare plans for the hatchery buildings, and to advertise for two weeks in one newspaper each, published in Fulton and Montgomery counties, for bids for the work, including all materials and labor required thereon, and to report such bids to the commission, the contract to be awarded to the lowest responsible bidder who shall give satisfactory security for the faithful performance of his contract within a time to be specified therein; that the work of preparing the grounds, building a dam, making the necessary connections with the hatchery, the construction of the troughs and other hatching apparatus, and the necessary improvement of roadway be done under the direction of the said superintendent, or such person as may hereafter be appointed by the commission as local superintendent, and that the sum of $1,000, or so much thereof as may be necessary, be paid out of the appropriation made by chapter 293, Laws of 1887, for such last specified purpose, provided, however, that no contract shall be let for the erection of buildings till the owners of lands in Township No. 9, adjoining the State lands upon which it is proposed to erect such hatchery, shall convey to the State, for the purposes of the hatchery, so much of said lands as shall be necessary to give control of Mill creek from the hatchery site to its sources.

On motion of Commissioner Bowman, it was

Resolved, That Superintendent Seth Green be authorized to expend from one hundred and fifty to one hundred and seventy-five dollars in the erection of an ice-house at Caledonia out of the funds appropriated to the Caledonia hatchery.

On motion of Commissioner Bowman, it was

Resolved, That an additional appropriation of $250, out of the general fund, be made for the hatchery at Clayton.

On motion of Commissioner Blackford, it was

Resolved, That a committee of two be appointed by the president of the board to select an office for the Commissioners of Fisheries. The president appointed Messrs. Blackford and Joline.

On motion of Commissioner Blackford, it was

Resolved, That the board shall meet on the first Monday in September next, and on the first Monday of each succeeding month thereafter at the office of the commission in the city of New York, for the purpose of hearing and granting applications for oyster land franchises.

On motion of Commissioner Bowman, it was

Resolved, That a copy of the proposed rules regulating the granting of oyster land franchises, presented by Commissioner Blackford, be made under the direction of the secretary, and sent to each of the commissioners, and that the further action be postponed till this has been done.

On motion of Commissioner Joline the appointment of a clerk to the commission was postponed to the next regular meeting of the board.

The president of the board was authorized by resolution to call a special meeting of the commissioners at any time he may think proper.

Upon the motion of Commissioner Sherman the board adjourned to meet at Cold Spring Harbor, on the following day, Tuesday, July 26, at 12 M.

COLD SPRING HARBOR, *July* 26, 1887.

The board met pursuant to adjournment, at Cold Spring Harbor, July 26, 1887, in the office of Fred Mather, superintendent of the hatchery located there. All the commissioners were present.

On motion of Commissioner Bowman it was ordered that 100 copies of the proposed rules be printed, under the direction of Commissioners Blackford and Joline, for use of the commission.

On motion of Commissioner Sherman, it was

Resolved, That Commissioners Roosevelt, Blackford and Joline be appointed a committee to prepare the necessary applications for franchises, under the provisions of chapter 584, Laws of 1887.

Superintendents Seth Green and Fred Mather were, by resolution, invited to accompany the commissioners on their tour of inspection of the Adirondack hatcheries.

The plans submitted to the board by Superintendent Mather, for the hatchery building at Cold Spring Harbor, authorized by chapter 613, Laws of 1887, were formally accepted, and, upon a motion of Commissioner Bowman, it was

Resolved, That President Roosevelt appoint a committee of one to supervise the construction of the hatchery building, according to the plans adopted, with power to have it built either by contract or day's work, at a cost not to exceed $4,500.

The president appointed as such committee Commissioner E. G. Blackford.

The president of the board was, by resolution, requested to convey to Mr. John D. Jones the appreciation by the Commissioners of Fisheries of his generous treatment of the commission, and Messrs. Roosevelt and Blackford were appointed a committee to arrange with him the terms of a requisite lease of the lands upon which the hatchery is to be built.

Adjourned.

At a special meeting of the Commissioners of Fisheries, duly called and held at Saratoga, Monday, August 22, 1877, all the members of the board being present except Commissioner Joline, the minutes of the meetings respectively held in the city of New York, July 25, 1887, and at Cold Spring Harbor, July 26, 1877, were read, the latter amended, and both approved.

The president reported that he had, according to order, expressed in a communication in writing, the thanks of the board to Mr. John D. Jones, for his liberal action in granting the use of lands for the purposes of the Cold Spring hatchery.

Mr. Blackford, from the committee appointed to report rules and forms for the regulation of the granting of oyster land franchises, reported a draft of such rules and forms, which was, on motion of Commissioner Sherman, amended in respect of the proposed rules numbered 2, 7 and 26 respectively, and by the addition, on the motion of Commissioner Roosevelt, of two additional rules, 28 and 29 respectively. And all further action on the subject was, on motion of Commissioner Bowman, postponed to the regular meeting to be held September five next.

Commissioner Bowman, to whom has been referred the subject of the purchase of additional lands for the use of the Caledonia hatchery, reported that he had completed negotiations for the purchase of such additional lands giving frontage on the road and to islands in Spring creek needed by the hatchery; that a contract for the purchase of the same had been approved by the Comptroller, in accordance with a law passed at the last session of the Legislature, and that a survey and investigation of title was in progress, preparatory to the execution

of a deed. On motion of Commissioner Sherman, the action of Commissioner Bowman in the premises was approved, and he was authorized to complete the transaction reported.

Commissioner Sherman offered the following resolution, which was agreed to:

Resolved, That the treasurer of the commission, E. G. Blackford, be authorized and directed to make requisition of the Comptroller for the moneys appropriated by the act (chapter 293 of the Laws of 1887) providing for the establishment of a fish hatchery at Mill creek, in the county of Hamilton, and by the act (chapter 613, Laws of 1887) for the erection of a new hatchery building and improvement of grounds at the Cold Spring Harbor hatchery, in the county of Suffolk; such money to be drawn from time to time in such sums as may be wanted, not exceeding fifteen hundred dollars at any one time for each hatchery, and to be accounted for by proper vouchers.

Adjourned.

At the regular monthly meeting of the Commissioners of Fisheries in the city of New York, Monday, September 5, 1887 — all present except Commissioner Sherman — the minutes of the last meeting were read and approved.

Commissioner Roosevelt reported verbally as to the visit by the commission to the Adirondack hatchery, that they had proceeded directly from Saratoga, after the meeting held there, to Paul Smith's, and from there to Little Clear pond or Lake Brandon, and found the hatchery admirably arranged for doing excellent work. The trouble that had been experienced in reference to keeping the spawning fish could be remedied by utilizing a very cold spring of water that was found near the house of the superintendent. This spring has a flow, with what comes from the surrounding soil, of nearly an inch of water, of which the temperature is as low as forty-two degrees in the hottest weather. The colder the water the more fish it will support, and, if necessary to get a stronger current, water taken from the lake could be added to it, although it was found that that water was in itself and alone too warm for the purpose. In this way it is hoped that a reasonable amount of breeding fish can be kept, enough to furnish half a million of eggs. The hatchery, which is well arranged, could handle a million easily, and the rest will be supplied from the hatchery at Caledonia, there being great need for restocking in the neighboring waters, which were found to be so far exhausted that not a dozen trout were brought to the hotel at any one time by the numerous parties

which were daily out trout fishing. This, however, might be partly accounted for by the unusual warmth of the water arising from the excessive heat of the month July of this year. In conclusion he stated that there was no reason to doubt that under the present management the hatchery would prove satisfactory in its results.

Several gentlemen interested in oyster culture being present were invited to give their views upon the rules for the regulation of the granting of oyster land franchises. Judge J. Lawrence Smith recommended a change in the rules as drafted by the commission which would allow the commission to grant franchises to persons who were not the highest bidders, whenever in the judgment of the board this was deemed for the best interest of the State, and as doing substantial justice. Mr. Hausman, of the Oyster Protective Association, took substantially the same view, and approved of leaving the selection, where there was competition for unoccupied lands, entirely with the commission to select the person most justly entitled to a deed. Mr. Monsell, of Greenport, who objected to Rule 26, when asked for any suggestion of amendment, proposed the same change. No other change was proposed by any one at this meeting.

Superintendent Seth Green and Hon. James S. Sherman were, on motion of Commissioner Bowman, invited to accompany the commissioners on their inspection of the oyster lands. A bill of W. D. Oviatt for furniture, tools, etc., at Caledonia, amounting to forty-eight dollars, was, on motion of Commissioner Blackford, audited and ordered paid out of the funds allotted to the Caledonia hatchery. A resolution offered by Commissioner Bowman that the clerk to be appointed by the commission shall hold his office only at the pleasure of the board was unanimously agreed to. The rules for the regulation of the granting of oyster land franchises were read, and on motion of Commissioner Blackford were unanimously adopted.

RULES OF THE COMMISSIONERS OF FISHERIES

In relation to granting of franchises in lands under water for the purpose of shell-fish cultivation, adopted September 5, 1887.

1. The commissioners will meet on the first Monday of each month at the office of the commission in the city of New York, for the purpose of hearing and granting applications for franchises.

2. Applications for franchises will be received by the clerk of the commissioners at any time, and the date of the reception will be indorsed at once upon the application.

3. Printed forms of application will be furnished by the clerk of the commission.

4. No grant of land will be made in excess of 250 acres.

5. The terms "occupation and use" will be held to mean in the opinion of the commissioners at least one year's actual occupation and use in planting and cultivating shell-fish.

6. Beds of oysters of natural growth will be held to mean permanent beds, not sporadic beds, of oysters growing naturally in sufficient quantities to be worked profitably.

7. In making applications, applicants must state on oath, that they believe that the grounds applied for are not already designated as natural beds, or occupied, unless by applicant. That the applicant wishes them for the purpose of cultivating shell-fish, and that the applicant is a resident of the State, and has been for at least one year next preceding date of application.

8. Applicants must describe in detail the lands applied for, giving their location, number of acres wanted, etc.

9. The grants of lands will be made as nearly as possible in accordance with the description given in the applications, but the commissioners will not grant lands bounded by other than by north and east lines except in cases where the shore lines prevent, and in special cases.

10. Long Island Sound will be divided into townships, sections and lots.

11. When an application has been made, the commissioners will cause the engineer to designate the vacant sections or lots nearest and including if possible the plot described, up to the limit of the land to be granted in each case. If no objection arises, the lands so designated will be granted and franchises issued upon payment to the clerk of the commissioners, of the proper fees and charges.

12. The lands applied for, if granted, will be buoyed or staked out under the direction of the engineer, who will place the owner at each of his respective corners and show him where to drop his buoys or plant his stakes, but in all cases the buoys, ground-tackle and stakes shall be supplied and furnished by the grantee or owner of the franchises.

13. After the franchise has been granted the owner will be required to keep the corners of his property distinctly staked or buoyed in accordance with the law; and each corner stake or buoy shall have stamped or otherwise permanently marked upon it a particular number, which number will be furnished by the engineer.

14. Records of the position of each stake or buoy at the several corners of the lands granted by the commissioners are on file at this office, and in the event of the loss of any of these stakes or buoys, the

owners can have them reset upon application and the payment of the actual expenses of resetting.

15. The charge for surveying shall be twenty-five cents per acre, with ten per cent additional for every corner in excess of four in any one lot, provided no lot shall be surveyed for less than one dollar.

16. Franchises may be sold, transferred, leased or assigned, but no person, firm or corporation will be allowed to hold in excess of 250 acres.

17. All transfers of franchises must be recorded at the office of the commissioners, and a transfer fee of fifty cents will be charged.

18. No franchise will be granted until one month's notice of the application for such franchise shall have been given by posting in a conspicuous place in the office of the Shell-Fish Commissioner, and in the office of the town clerk of the town nearest the lands applied for.

19. The franchises thus granted shall be deemed to be personal property, and courts of law and of equity shall have power and jurisdiction thereto as though such franchises were actually personal property.

20. For the purpose of hearing and granting applications for franchises in lands under water, three commissioners shall constitute a quorum of the board.

21. The clerk shall give a bond in the penal sum of $5,000 for the faithful performance of his duties, and the prompt payment by him to the State Treasurer of all moneys received by him for the sale of franchises.

22. The accounts of the clerk will be audited at each monthly meeting of the commission by a committee to be appointed by the president of the commission.

23. No grant of lands in present occupation and use shall be made except to the actual occupant and owner thereof, provided said occupant or possessor, within one year from June 16, 1887, shall make application for and purchase the same.

24. All disputes as to boundary lines will be referred to the engineer, and the decision of the engineer, if agreed to by the commissioners, will be final.

25. Whenever any grant of land so made shall fail to be occupied in good faith for the cultivation of shell-fish by the grantee thereof within two years after the date of said grant, the land so granted shall revert to the State.

26. All franchises, except where the land has been in occupation or cultivation, shall be disposed of at public auction to the highest responsible bidder, after two weeks notice of the proposed sale to be

posted in the office of the commissioners and to be published once in each week for two weeks in a newspaper published in the county where the lands lie.

27. The commissioners reserve the right to reject any or all bids.

28. All objections to the granting of franchies shall be filed with the clerk and notices of hearing before the commission shall be given to applicants and objectors.

29. These regulations may be amended only at a regular meeting of the commission after notices in writing to all the commissioners of the proposed amendment.

The president of the board was, on motion of Commissioner Bowman, authorized to have 1,000 copies of the rules printed and, on motion of Commissioner Blackford, was also empowered to have printed 500 copies each of the forms of application, conveyance, etc.

Adjourned.

At the regular monthly meeting of the Commissioners of Fisheries, at the office of Commissioner Blackford in Fulton market, New York, on Monday, October 3, 1887; all the members of the board present except the president. Commissioner Sherman, upon motion of Mr. Blackford, was made chairman, and the minutes of the last meeting were read, amended and approved. Commissioner Sherman moved a reconsideration of the vote at the last meeting, adopting rules twenty-six and twenty-seven, and gave notice that he would move for adoption in their stead the following:

Rule 26.— One month's notice shall be given by posting in the office of the commissioner in the city of New York, and by advertisement in two newspapers, each published in the county where the lands to be disposed of shall be situated, that on a day to be stated in such notice and within one week of the date of the last publication thereof sealed bids will be received for grants to be specified by their survey numbers. On a day to be also stated in such notice, all the bids shal, be opened by the commissioners at a meeting of the board to be held for that purpose.

No bid for a sum of less than two dollars per acre for such lands shall be considered, and the board shall have discretion to accept such bids as they shall deem for the best public interest, and to reject any and all that they shall not deem it good policy to accept. Franchises in conformity to these conditions, may then be issued in the manner provided by law. The vote on each proposed grant shall be taken by yeas and nays which shall be entered on the journal, and the affirmative vote of a majority of all the members of the commission shall

be necessary to each grant. The motion was by resolution of the board laid on the table till the next regular meeting, and the secretary was directed to furnish each commissioner with a copy of the proposed substitute.

Commissioner Blackford offered a resolution, which was agreed to, that the secretary prepare a revised copy of the synopsis of the game laws of the State, published as a poster, December 1, 1886, and to have 5,000 copies printed for distribution to the game and fish protectors.

The printed forms of application, conveyance, etc., submitted to the Board at the last meeting by Shell-Fish Commissioner Blackford, were, upon motion of Mr. Bowman, adopted.

On motion of Commissioner Joline, the board proceeded to the appointment of a clerk, by yeas and nays, and Mr. Edward P. Doyle, of Richmond county, was unanimously elected clerk to the commission, at a salary of $1,500 a year, and the office hours decided to be, until further notice, from 9 A. M. to 4 P. M.

Commissioners Blackford and Joline were appointed a committee to suitably furnish the office of the commission with necessary furniture, blank books, stationery, etc., to be paid for out of the funds appropriated for the contingent expenses of the commission.

On motion of Commissioner Blackford, it was

Resolved, That the lease executed by John D. Jones to the people of the State of New York, of the lands at Cold Spring Harbor, to be occupied by the Commissioners of Fisheries for fish hatchery purposes, be accepted, and a copy thereof filed in the office of the Secretary of State, at Albany.

On motion of Commissioner Blackford, it was

Resolved, That in the matter of constructing a fish-way in the dam across the Hudson river at Troy, the commissioners approve and recommend what is known as the McDonald fish-way, as the best known to them for said dam.

The charges preferred by J. B. Poucher and others, of Oswego, against Protector William N. Steele, twelfth district, for dereliction of duty, were, upon motion of Mr. Blackford, ordered to be reported to the Governor, with the recommendation that the said protector be removed.

Commissioner Blackford submitted a form, in blank, of a notice of application for oyster bed franchises, having been made, which was approved, and 500 copies ordered to be printed. He also suggested a change in the form for application, and this form was referred to Commissioners Joline and Blackford, with power to amend before printing.

Commissioner Sherman brought to the attention of the Board the July reports of Protectors Whitaker, Godwin, Wood, Brinckerhoff, Phelps, Lindley and Sheridan, he having declined to sign certificates in these cases, for reasons stated in a communication to the secretary, which was read to the board.

These reports, together with the August reports of said protectors, were referred for examination and report thereupon at the next meeting, as follows:

The reports of Protectors Whitaker and Godwin to Messrs. Roosevelt and Blackford; that of Protector Sheridan to Bowman; and those of Protectors Brinckerhoff, Phelps, Lindley and Wood to Commissioner Sherman.

Adjourned.

At a regular monthly meeting of the Commissioners of Fisheries, at their office in the city of New York, on Monday, November 3, 1887; all the commissioners present; the minutes of the last meeting were read and approved. Mr. George Dodge, of Saddle Rock, for himself and others desired to interpose objections to the granting by the commission of oyster land franchises in Little Neck bay.

President Roosevelt decided that the matter came within the province of Shell-Fish Commissioner Blackford, who announced that he would give a hearing to all parties interested, on Tuesday, fifteenth inst., at his office in Fulton market.

Application for oyster franchises were presented as follows:

No. 1. Hiram Monsell, Brookhaven.

No. 2. Hiram Monsell, Brookhaven; both for unoccupied lands, and both applications having upon examination been found defective. No action was taken upon them.

No. 3. E. P. Manee, Westfield, Richmond county.

No. 4. J. H. Merrill, Northfield, Richmond county.

Commissioner Blackford reported verbally that the lands applied by Mr. Manee were in actual occupation by the applicant, and Engineer Ford certified that said lands do not exceed 250 acres, whereupon, on motion of Commissioner Joline, the application, which enumerates lots 7, 21, 63, 100, 103, 105 and 131, Princess bay, was granted, all the commissioners voting in the affirmative. Application No. 4, of J. H. Merrill, was then considered. The Shell-Fish Commissioner made the same report as to actual occupation by the applicant as in the former case, and as to lot 4 named in the application, the engineer certified that it did not contain over 250 acres, and

on motion of Commissioner Blackford the application was granted for that specified lot, all the commissioners voting in the affirmative. Mr. Merrill's application for the second lot was referred to the engineer for survey at the expense of the applicant.

The vote adopting Rules 26 and 27 was, upon motion of Commissioner Sherman, reconsidered, and the substitute for them offered by him at the last meeting was adopted, with the following amendments: The clause naming the price per acre for lands applied for was altered so as to read, "No bid for a sum of less than one dollar per acre for such lands shall be considered." After the paragraph touching the opening of sealed bids, upon motion of Commissioner Roosevelt, the following clause was inserted: "That the opening of the bids may be postponed, and in case of a failure to have a quorum of the commission present, shall lie over until the next meeting. Rule 26, as thus adopted, reads as follows:

RULE 26. One month's public notice shall be given, by posting in the office of the commissioners in the city of New York, and by advertisement in two newspapers, each published in the county where the lands to be disposed of shall be situated, that on a day to be stated in such notice and within one week from the date of the last publication thereof, sealed bids will be received for grants to be specified by their survey number.

On a day also to be stated in such notice, all the bids shall be opened by the commissioners, at a meeting of the board to be held for that purpose. The opening of the bids may be postponed, and, in case of a failure to have a quorum of the commission present, shall lie over until the next meeting.

No bid for a sum of less than one dollar per acre for such lands shall be considered, and the board shall have discretion to accept such bids as they shall deem for the best public interest, and to reject any and all bids that they shall not deem it good policy to accept. Franchises in conformity to these conditions may then be issued in the manner provided by law. The vote on each proposed grant shall be taken by yeas and nays, which shall be entered upon the journal, and the affirmative vote of a majority of all the members of the commission shall be necessary to each grant.

On motion of Commissioner Blackford, the clerk of the commission was directed to have printed 500 copies of the new Rule 26, and also 500 copies of the Oyster Law.

On motion of Commissioner Blackford, it was

Resolved, That the price of occupied lands in Princess or Raritan bay be fixed at fifty cents per acre.

On motion of Commissioner Blackford, it was

Resolved, That each applicant for a franchise shall furnish the commission with an affidavit that the proper notices have been posted in the offices of the Shell-Fish Commissioner and of the town clerk nearest the lands applied for, and that no grant shall be issued by the clerk of the commission until proper evidence of posting according to law is in his hands.

In the matter of the lands under water in Huntington bay, which was discussed at considerable length by Mr. Charles R. Street, representing the town of Huntington, and by Mr. George A. Black, representing John H. Lowndey. On motion of Commissioner Blackford, the case was referred to Commissioners Roosevelt and Bowman for examination as to the jurisdiction of the commission.

On motion of Commissioner Blackford the clerk was authorized to employ an office boy at an expense not to exceed three dollars a week. Commissioner Sherman offered a resolution, which was agreed to, that the plans and specifications for the Lake Pleasant hatchery, submitted by Superintendent Seth Green, be approved, subject to such modifications as shall be directed by Commissioner Sherman.

The commissioners, to whom were referred at the last meeting the July and August reports of several of the protectors, reported verbally the results of their investigations, and the board directed the secretary to issue the usual certificates.

On motion of Commissioner Sherman, it was

Resolved, That the recommendation heretofore made by the commissioners to the Governor for the appointment of William A. Light as a game and fish protector in the place of Nathan C. Phelps, whose official term has expired, be withdrawn, and that Christopher Goodsell, of Old Forge, Herkimer county, be recommended for such appointment.

Resolved further, That the recommendation of the appointment of Wiliam H. Lindley, as game and fish protector, to succeed himself, be also withdrawn, and that Edward E. Carr, of Union Springs, Cayuga county, be recommended for such appointment.

On motion of Commissioner Bowman, it was

Resolved, That in the matter of the petition of H. Wilbur and others, the reply thereto of Superintendent Fred Mather, as read by Commissioner Blackford to the board, be communicated to the petitioners by that commissioner.

On motion of Commissioner Sherman, it was

Resolved, That the moneys appropriated by the annual appropriation bill for the fiscal year commencing October 1, 1887, for the purposes of the commission, be apportioned as follows:

For the hatchery at Caledonia	$13,000
For the hatchery at Cold Spring Harbor	4,000
For the hatchery at Lake Brandon	4,500
For the hatchery at Clayton	1,500
For the hatchery at Fulton Chain	1,500
For the general contingent expenses of the commission	1,500
	$26,000

Adjourned.

Distribution of Carp made by Commissioner Eugene G. Blackford during the season of 1887, *the same having been received from the United States Commission of Fish and Fisheries.*

NAME.	Address.	Number of carp.
George H. Spink	Rome, Oneida county	20
G. R. Stedman	Rome, Oneida county	20
James Riley	Boonville, Oneida county	20
John J. Frulayson	Boonville, Oneida county	20
Alfred E. Staney	Skaneateles, Onondaga county	20
Fred S. Hall	Skaneateles, Onondaga county	20
D. F. Quinby	Warners, Onondaga county	20
James E. Sitts	Amsterdam, Montgomery county	20
John Odell	North Palma, Monroe county	20
A. Ruhlmann	Lockport, Niagara county	20
Eng. Ruhlmann	Lockport, Niagara county	20
Robert S. Brierly	Camden, Oneida county	20
Mrs. O. P. Dickie	Buffalo, Erie county	20
Mrs. O. P. Dickie	Buffalo, Erie county	6
C. J. Reynolds	Poughkeepsie	20
Levi B. Eshleman	Clarence Centre, Erie county	20
Jason D. Ames	Lake View, Erie county	20
Jacob Root	Clarence Centre, Erie county	20
E. M. Boynton	Burke, Franklin county	20
Gideon D. Longshore	Herkimer, Herkimer county	20
George M. Coe	Wampsville, Madison county	20
Martin W. Whish	1 Partridge street, Albany	20
John B. Gamble	Freedom, Cattaraugus county	20
Mc. S. Vosburg	Hillsdale, Columbia county	20
John Robinson	Pottsdam, St. Lawrence county	20
G. O. House	West Shoken, Ulster county	20
Jacob Albright	Ontario, Wayne county	20
J. A. Michner	Watkins Glen, Schuyler county	20
A. C. Tatman	East Bloomfield, Ontario county	20
William G. Antis	Canandaigua, Ontario county	20
Ora Lee	Knowlesville, Orleans county	20
Lehbens	Oswego, Oswego county	20
Stillman Cooper	Harrisville, St. Lawrence county	20
B. F. Chandler	Harrisville, St. Lawrence county	20
William Hart	Moore's Forks, Clinton county	20
C. H. Stott	Hudson	50
J. Q. Adams	Watertown	50
H. A. Allard	Sandy Creek, Oswego county	20
Nicholas Rhodes	Parish, Oswego county	20
Simeon Fulton	Carthage	20
W. H. Roberts	Clinton, Oneida county	20
Alfred Seymour	Lebanon, Madison county	20
Myron Keith	Deanville, Oneida county	20

Distribution of Carp — (Continued).

NAME.	Address.	Number of carp.
Ira O. Ellinwood	Clinton, Oneida county	20
C. A. McArthur	Loon Lake, Franklin county	20
Peter Keefer	Coeyman's Junction, Albany county	20
Andrew J. Whiebeck	New Scotland, Albany county	20
C. L. Jones	Harpersville, Broome county	20
Rev. J. Martin	Guilderland Station, Albany county	100
S. C. Brown	South Ballston, Saratoga county	20
J. M. Robinson	New Berlin, Otsego county	20
C. Matt	Livingston Manor, Sullivan county	20
John Todd	Fallsburg, Sullivan county	20
A. Bower	Kingston, Ulster county	30
J. Anthony	Ushert, Saratoga county	20
S. C. Brown	South Ballston, Saratoga county	20
I. P. Letts	Central Bridge, Schoharie county	20
A. Dings	Middleburg, Schoharie county	20
P. W. Day	Oneonta, Otsego county	20
R. A. Deinck	Troy, Rensselaer county	20
H. D. Can	Oneonta, Otsego county	20
D. C. Dow	Cobleskill, Schoharie county	20
J. H. Tarter	Cobleskill, Schoharie county	20
S. Brown	Cobleskill, Schorarie county	20
L. P. Clark	Springfield Center, Otsego county	20
A. S. Pease	Tiashoke, Rensselaer county	20
L. Howe	Howes Cave, Schoharie county	20
A. Kneesken	St. Johnsville, Montgomery county	20
J. O. Beens	Saugerties, Ulster county	20
C. A. McArthur	Paul Smith's, Franklin county	20
D. H. Fonda	Albany, Albany county	500
M. Schrodt	Albany, Albany county	20
M. K. Post	Clayville, Oneida county	20
C. D. Wheeler	Clayville, Oneida county	20
J. P. Harnett	Apulia, Onondaga county	20
P. Dougherty	Perryville, Madison county	20
J. O. Hamilton	Friendship, Allegany county	20
A. Briggs	Wellsville, Allegany county	20
H. Anthony	Levanna, Cayuga county	20
C. P. Endler	Perkinsville, Steuben county	20
A. Gattschall	Perkinsville, Steuben county	20
N. Matteson	Varysburgh, Wyoming county	20
G. J. Edgerton	Rock Stream, Yates county	20
T. P. Hennessey	North Java, Wyoming	20
H. Bower	Ludlowville, Tompkins county	20
R. L. Danagh	Sheldrake, Seneca county	20
Dr. A. Majensky	Perkinsville, Steuben county	20
G. N. Moyer	Sanquoit, Oneida county	20

Distribution of Carp — (Continued).

NAME.	Address.	Number of carp.
F. Bookslaver	Montgomery, Orange county	20
C. D. Howell	Ludlowville, Tompkins county	20
J. J. Blauvelt	Pearl River, Rockland county	20
C. Delany	Andover, Allegany county	20
J. A. Joneles	Hinelts, Livingston county	20
C. B. Carter	Dalton, Livingston county	20
J. P. Covert	Montgomery, Orange county	20
J. Woodlock	Pine Bush, Orange county	20
H. H. Bertholf	Monroe, Orange county	20
D. B. Cansfort	Montgomery, Orange county	20
W. A. Wisner	Warwick, Orange county	20
R. F. Gist, Jr	Orange, Orange county	20
J. J. Young	Ramsays, Bergen county	20
I. Orr	Big Creek, Steuben county	20
C. A. Davison	Caton, Steuben county	20
J. S. Clarke	Alfred, Allegany county	20
T. B. Livingston	Cold Spring Harbor, Suffolk county	20
S. W. Randell	Yap Hand, Suffolk county	20
P. Gardner	Good Ground, Suffolk county	20
H. A. Cassabee	Newtown, Queens county	20
J. D. Cook, Jr	Bridge Hampton, Suffolk county	20
J. R. Ely	Jamaica, Suffolk county	20
V. Frost	Locust Valley, Queens county	20
H. Jones	Huntington, Suffolk county	20
E. Tuthill	Mattituck, Suffolk county	20
C. M. Raymond	West New Brighton, Richmond county,	20
O. Erum	Perth Amboy, Middlesex county	20
A. Sutherland	Perth Amboy, Middlesex county	20
C. M. Raymond	West Brighton, Richmond county	20
S. Acker	Sing Sing, Westchester county	20
L. Helbling	Cypress Hills, Suffolk county	20
F. Blanche	Linden, Union county	20
A. McLeich	Rahway, Union county	20
S. K. Sattoh	Rye, Westchester county	20
Mrs. W. N. Randell	Rockville Center, Queens county	20
Dr. W. W. Randell	Watch Hill, Washington county	20
J. Burning	Sea Side, Richmond county	20
A. Willits	Jericho, Kings cunty	20
H. H. Purdy	Peekskill, Westchester county	20
B. F. Richards	Green Ridge, Richmond county	20
C. J. Frye	Fordham	20
R. Green	Catherine market	20
H. Herat	Sea Side, Richmond county	20
R. H. Marks	——— Kings county	20
T. A. Johnson	Ridgewood, Queens county	20

Distribution of Carp — (Concluded).

NAME.	Address.	Number of carp.
A. F. Richards	Green Ridge, Richmond county	20
J. H. Grindle	Spring Valley, Rockland county	20
N. Thun	Lyosset, Queens county	20
G. Wasch	Flushing, Queens county	20
Mutual Life Insurance	New York, New York county	20
T. C. Smith	Poughkeepsie	20
G. B. Fairs	Noynt, Monmouth county	20
D. A. Hullett	New York	20

COMMISSIONERS OF FISHERIES.

The following list of the Commissioners of Fisheries of the United States, the several States and territories, and of the Canadian provinces, has been compiled from information recently obtained by the secretary from first hands, and is believed to be full and accurate:

Dominion of Canada.— John Tilton, deputy minister of fisheries, Ottawa, Ont.

Province of New Brunswick.— W. H. Venning, inspector of fisheries, St. John.

Province of Nova Scotia.— W. H. Rogers, inspector, Amherst; A. C. Bertram, assistant inspector, Amherst.

Province of Prince Edward Island.—J. H. Duvar, inspector, Alberton.

Province of Quebec.— W. Wakeham, inspector, Lower St. Lawrence and Gulf division, Gaspe basin.

Province of British Columbia. — Thomas Mowat, inspector, New Westminister.

Province of Manitoba and North-west Territories.— Alex. McQueen, inspector, Winnipeg, Man.

The United States.— Professor G. Brown Goode, Washington, D. C.; assistant commissioner, J. H. Kidder. Assistants in charge: fishculture, Marshall McDonald; scientific inquiry, Richard Rathbun; statistical inquiry, R. Edward Earle.

Alabama.— Col. D. R. Hundley, Madison; Hon. Charles S. G. Doster, Prattville.

Arkansas.— H. H. Rottaken, president; J. W. Calloway and W. B. Worthen, all of Little Rock.

Arizona.— J. J. Gosper, Prescott; Richard Rule, Tombstone; J. H. Taggart, business manager, Yuma.

California.—T. J. Sherwood, Marysville; Joseph D. Redding, San Francisco; J. D. Harvey, Los Angeles.

Colorado.—G. F. Whitehead, Denver; E. V. Bogart, superintendent.

Connecticut.—Dr. William M. Hudson, Hartford; Robert G. Pike, Middletown; James A. Bill, Lyme.

Dakota.—No commission.

Delaware.—Elwood R. Norny, Odessa; Dr. E. G. Shortlidge, assistant and superintendent of hatcheries, Wilmington.

Florida.—No commission.

Georiga.—Hon. J. T. Henderson, commissioner of agriculture, Atlanta; Dr. H. H. Cary, superintendent of fisheries, LaGrange.

Illinois.—N. K. Fairbank, president, Chicago; S. P. Bartlett, secretary, Quincy; Major George Brenning, Centralia.

Indiana.—Enos B. Reed, Indianapolis.

Iowa.—E. D. Carlton, Spirit Lake; Ole Bjorensen, superintendent of Hatchery, Spirit Lake.

Kansas.—S. Fee, Wamego.

Kentucky.—William Griffith, president, Louisville; P. H. Darby, Princeton; John B. Walker, Madisonville; Hon. J. C. Walton, Munfordville; Hon. John A. Steele, Versailles; W. C. Price, Dansville; Dr. W. Van Antwerp, Mt. Sterling; Hon. J. M. Chambers, Independence; A. H. Goble, Catlettsburg; J. H. Mallory, Bowling Green.

The commission has been without funds for about four years and consequently no work has been done.

Maine.—E. M. Stillwell, Bangor; Henry O. Stanley, Dixfield, commissioners of fish and game. B. W. Counce, Thomaston, commissioner of sea and shore fisheries.

Maryland.—G. W. Delawder, Oakland; Dr. E. W. Humphreys, Salisbury.

Massachusetts.—Frederick W. Putnam, Cambridge; Edward A. Brackett, Winchester; Edward H. Lathrop, Springfield.

Michigan.—John H. Bissell, Detroit, president; Dr. J. C. Parker, Grand Rapids; Herschel Whitaker, Detroit; W. D. Marks, superintendent, Paris; A. J. Kellogg, secretary, Detroit; William A. Butler, Jr., treasurer, Detroit.

Minnesota.—Robert Ormsby Sweeny, St. Paul, president; Niles Carpenter, Rushford; William Bird, Fairmount; S. S. Watkins, superintendent.

Mississippi.—No commission.

Missouri.—H. M. Garlichs, chairman, St. Joseph; J. L. Smith, Jefferson City; H. C. West, St. Louis; A. P. Campbell, secretary, St.

Joseph. Superintendents: Philip Kopplin, Jr., St. Louis; Elias Cottrill, St. Joseph.

Montana.—No commission.

Nebraska.—W. L. May, Fremont; R. R. Livingston, Plattsmouth; B. E. B. Kennedy, Omaha; M. E. O'Brien, South Bend, superintendent.

Nevada.—W. M. Cary, Carson City.

New Mexico.—Has no commission, but Governor Ross intends to have one established. Hon. E. S. Stover, Albuquerque, has given the subject much attention, and will impart information.

New Hampshire.—George W. Riddle, Manchester, chairman; E. B. Hodge, Plymouth; John H. Kimball, Marlboro; E. B. Hodge, superintendent.

New Jersey.—Richard S. Jenkins, Camden; William Wright, Newark; F. M. Ward, Newton.

New York.—Hon. R. B. Roosevelt, president, 120 Broadway, New York; General R. U. Sherman, New Hartford, Oneida county; E. G. Blackford, treasurer, Bedfork bank, Brooklyn; William H. Bowman, Rochester, Monroe county; A. S. Joline, Tottenville, Richmond county; E. G. Blackford, shell-fish commissioner, Fulton market, New York; Clerk of the Board, Edward P. Doyle, Potter building, New York room 110. Superintendents: Seth Green, Rochester; Fred Mather, Cold Spring Harbor; Monroe A. Green, Mumford; James A. Marks, Bloomingdale.

North Carolina.—W. J. Griffin, Elizabeth City, chairman; R. B. Watson, Engelhard; W. T. Caho, Bayborough.

Ohio.—C. V. Osborn, Dayton, president; J. H. Laws, Cincinnati; John Hofer, Bellaire, A. C. Williams, Chagrin Falls, secretary; E. D. Poller, Toledo.

Oregon.—F. C. Reed, Clackamas, president; R. C. Campbell, Ranier; E. P. Thompson, Astoria.

Pennsylvania.—Henry C. Ford, president, 524 Walnut street, Philadelphia; James V. Long, 205 Ridge avenue, Allegheny City; H. C. Demuth, secretary, Lancaster; S. B. Stilwell, Scranton; A. S. Dickson; Meadville; W. L. Powell, Harrisburg.

Rhode Island.—John H. Barden, president, Rockland; Henry T. Root, treasurer, Providence; Wm. P. Morton, secretary, Johnston—commissioners inland fisheries. James C. Collins, North Providence; N. P. S. Thomas, North Kingstown; James M. Wright, Foster—shell-fish commissioners.

South Carolina.—Hon. A. P. Butler, Columbia, commissioner of agriculture, *ex-officio*, fish commissioner.

Tennessee.— W. W. McDowell, Memphis; H. H. Sneed, Chattanooga; Edward D. Hicks, Nashville.

Texas.— Commission abolished.

Utah.— No commission. A Milton Musser, acting fish commissioner, Salt Lake City.

Vermont.— Frank Atherton, Waterbury; Herbert Brainerd, St. Albans.

Virginia.— Col. Marshall McDonald, Washington, D. C.

West Virginia.— C. S. White, president, Romney; F. J. Baxter, treasurer, Sutton; James H. Miller, secretary, Hinton.

Wisconsin.— The Governor *(ex-officio)*; Philo Dunning, president, Madison; C. L. Valentine, secretary and treasurer, Janesville; Mark Douglas, Melrose; A. V. H. Carpenter, Milwaukee; Calvert Spensley, Mineral Point; E. S. Miner, Sturgeon Bay. James Nevin, superintendent, Madison.

Wyoming Territory.— Otto Gramm, Laramie. (Dr. W. N. Hunt, Cheyenne, is commissioner for Laramie county and B. F. Northington, Rawlins, is commissioner for Carbon county.)

STATE OF NEW YORK.

No. 32.

IN ASSEMBLY,

JANUARY 24, 1888.

ANNUAL REPORT

OF THE

RECEIPTS AND EXPENDITURES OF THE COOPER UNION FOR THE ADVANCEMENT OF SCIENCE AND ART, FOR THE YEAR ENDING DECEMBER 31, 1887.

STATE OF NEW YORK:

EXECUTIVE CHAMBER,
ALBANY, *January* 24, 1888.

To the Legislature:

I have the honor to transmit herewith the Annual Report of the Cooper Union for the Advancement of Science and Art.

DAVID B. HILL.

REPORT.

To the Legislature of the State of New York, and the Common Council of the City of New York, as required by the Charter of the said Corporation:

REVENUE.

Rents from stores, offices and large hall	$43,382 12
Miscellaneous receipts	2,273 72
Donations	400 00
Total revenue	$46,055 84

EXPENDITURES.

For free night classes in science and art	$10,241 78
For free art school for women	8,903 36
For free school of stenography for women	636 35
For free library	4,850 99
For free reading-room	1,818 72
For free lectures	490 35
For care of building	4,056 10
For heat and ventilation	6,324 35
For office expenses	1,915 36
For repairs and improvements	2,115 29
For furnishing	450 02
For printing and stationery	822 07
For advertising	215 65
For gas	2,562 82
For postage	171 25
For sundries	37 45
For Women's Centennial Union Fund	183 00
For rewards to employes	203 00
Total expenditures	$45,997 91

General Cash Statement.

Dr.

Balance in treasury January 1, 1887	$4,205 48
Receipts as per statement above	46,055 84
Money borrowed during the year	9,286 87
	$59,548 19

Cr.

Expenditures as per statement above	$45,997 91
Loans paid off	9,286 87
Balance in treasury January 1, 1888	4,263 41
	$59,548 19

Financial Condition.

Current Assets.

Balance in treasury January 1, 1888	$4,263 41
Rents due	990 82
	$5,254 23

Current Indebtedness.

Accounts audited	$4,056 27
Grim legacy	1,449 87
Women's Centennial Union Fund	1,749 03
Cooper, Hewitt & Co	462 50
	$7,717 67

City and County of New York, *ss.:*

Edward Cooper, Wilson G. Hunt, Daniel F. Tiemann, John E. Parsons and Abram S. Hewitt, being duly and severally sworn, do, and each for himself doth depose and say, that they are trustees of the Cooper Union for the Advancement of Science and Art, and that the foregoing is a true account of all the receipts and expenditures of the said trustees for the year ending December 31, 1887, to the best of their knowledge and belief.

EDWARD COOPER.
WILSON G. HUNT.
DANIEL F. TIEMANN.
JOHN E. PARSONS.
ABRAM S. HEWITT.

Sworn to before me this 13th day of January, 1888.

Daniel R. Garden,
Notary Public, City and County of New York.

ANNUAL REPORT

OF THE

ADJUTANT-GENERAL

OF THE

STATE OF NEW YORK.

TRANSMITTED TO THE LEGISLATURE JANUARY 24, 1888.

THE TROY PRESS COMPANY, PRINTERS.
1888.

STATE OF NEW YORK.

No. 33.

IN ASSEMBLY,

JANUARY 24, 1888.

ANNUAL REPORT OF THE ADJUTANT-GENERAL.

STATE OF NEW YORK:

EXECUTIVE CHAMBER,
January 24, 1888.

To the Legislature:

I have the honor to transmit herewith the Annual Report of the Adjutant-General for the year 1887.

DAVID B. HILL.

REPORT.

General Headquarters, State of New York,
Adjutant General's Office,
Albany, *December* 31, 1887.

Hon. David B. Hill, *Governor and Commander-in-Chief:*

Sir.—I have the honor to submit the following report for the year 1887:

Militia.

The estimate made in my last report of the number of men subject to military duty was based upon the last United States census, and although it is probably understated, nothing can be definitely ascertained until another enumeration or census is published.

The efforts made to induce Congress to amend the obsolete militia laws of the United States and to assist the States in arming and improving the militia forces, have resulted only in a comparatively small increase of the amount to be distributed in kind among all the States and Territories. In order to bring this matter of the amendment of the militia laws to the attention of the national legislature, and to secure, if possible, adequate allowances of military property, the "National Guard Association of the United States" was organized in New York in 1878. After correspondence with the leading military officers of the various States, a convention was called which met at the city of New York in January, 1879, at which eighteen States were represented, when a regular organization was formed, General George W. Wingate of New York being elected president, and an executive committee elected consisting of one officer from New England, the Middle, Southern, Western and Pacific States.

Subsequent conventions, in which the number of States represented continued to increase, were held at St. Louis in 1879, Philadelphia in 1881, Cincinnati in 1884, and Washington in 1885, when twenty-two States and Territories were represented, viz.:

Maine, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, North Carolina, Virginia, Kentucky, Tennessee, Louisiana, Ohio, Illinois, Indiana, Michigan, Missouri, Kansas, Nebraska, Colorado, Minnesota, California and the District of Columbia.

A carefully drawn bill for the improvement of the militia was prepared by the association at its first convention in 1879, and was presented to Congress at its next session. This was reported favorably, but no action was taken upon it. At the next session the bill was remodeled to avoid criticisms that had been made in regard to it, and has been reintroduced at every succeeding Congress. Although favorably reported and commended by every Secretary of War and President since 1880, it never came to a vote in the House of Representatives until 1884, when it failed to receive sufficient votes to be taken up.

In 1884 the bill was divided into the "Sewell" bill, introduced in the Senate, simply providing for an increase in the appropriation, and the "Slocum" bill, introduced in the House of Representatives, which was intended to modernize the obsolete provisions of the United States Revised Statutes in regard to the militia. The "Sewell" bill, after having passed the Senate at several previous sessions, was finally passed by the House in December, 1886, with the appropriation reduced from $600,000 to $400,000, which change was concurred in by the Senate and the bill became a law. The "Slocum" bill has never come to a vote in either chamber.

NATIONAL GUARD.

The Military Code provides that the "aggregate force" of the National Guard, "in time of peace, fully armed, uniformed and equipped, shall not be less than 10,000 and not over 15,000 enlisted men." At the date of the latest quarterly returns, September thirtieth ultimo, the force consisted of 726 officers and 11,909 enlisted men, aggregating 12,635 officers and enlisted men, as against 12,480 at the same date the preceding year. There has been some increase by recruiting since the returns of the last quarter were made, and the aggregate now approximates 13,000 officers and enlisted men. The Inspector-General reports that there were present at the annual inspection and muster, 10,444 officers and enlisted men.

There are fifteen regiments, one battalion and forty-four separate companies of infantry, and five batteries of artillery, organized as four brigades.

The First Brigade, Brigadier-General Louis Fitzgerald, with head-quarters at the city of New York, consists of the First and Second batteries and the Seventh, Eighth, Ninth, Eleventh, Twelfth, Twenty-second, Sixty-ninth and Seventy-first regiments of infantry, aggregating 5,514 officers and men, of which number there were present at the annual inspection and muster 4,578.

The Second Brigade, Brigadier-General Jas. McLeer, with head-quarters at Brooklyn, consists of the Third battery, the Thirteenth, Fourteenth, Twenty-third, Thirty-second and Forty-seventh regiments, and the Seventeenth separate company of infantry, aggregating 2,747 officers and men, of which 2,358 were present at the annual inspection and muster.

The Third Brigade, Brigadier-General Amasa J. Parker, Jr., with head-quarters at Albany, consists of the Sixth battery, the Tenth battalion, and the Third, Fourth, Fifth, Sixth, Seventh, Ninth, Tenth, Eleventh, Twelfth, Fourteenth, Fifteenth, Sixteenth, Eighteenth, Nineteenth, Twentieth, Twenty-first, Twenty-second, Twenty-third, Twenty-fourth, Twenty-seventh, Twenty-eighth, Thirty-first, Thirty-second, Thirty-third, Thirty-fifth, Thirty-sixth, Thirty-seventh, thirty-ninth and Forty-fourth separate companies of infantry, aggregating 2,401 officers and men, having 1,974 present at the annual inspection and muster.

The Fourth Brigade, Brigadier-General Peter C. Doyle, with head-quarters at Buffalo, consists of the Fifth battery, the Sixty-fifth and Seventy-fourth regiments, and the First, Second, Eighth, Thirteenth, Twenty-fifth, Twenty-sixth, Twenty-ninth, Thirtieth, Thirty-fourth, Thirty-eighth, Fortieth, Forty-first, Forty-second and Forty-third separate companies of infantry, aggregating 1,939 officers and men, having present at the annual inspection and muster 1,534.

Since the last annual report of this department, the Fourth battery, stationed at Troy, and the Twenty-fourth separate company of infantry, at Utica, have been disbanded, on the application and representations of the commanding officer of the brigade, and the recommendation of the Inspector-General. The Fourth battery was mustered out of service February 25th, and the Twenty-fourth separate company March 11th, of this year.

Three separate companies of infantry have been organized, viz.: one at Olean, designated as the Forty-third, and attached to the Fourth brigade; another at Middletown, designated as the Twenty-fourth, and attached to the Third brigade; and a third at Utica, designated as the Forty-fourth, and attached to the Third brigade.

Signal and telegraph corps, to be attached to the headquarters of the First and Second brigades, have been authorized. The men enlisted, or the majority of them, are required to be practical telegraph operators. It is proposed to instruct them in all matters pertaining to telegraphy which may be necessary in the field, as well as in all the approved modes of signaling.

By a recent order prepared by the Surgeon-General, and published as general orders No. 36, men are to be detailed in all the regiments and battalions, and in all the batteries and separate companies having medical officers, to serve as members of "ambulance corps," in their respective commands. They are to be instructed in the care of the sick and wounded, and especially in rendering first aid to the injured.

The condition of the several organizations, considered with reference to their composition, instruction and discipline, is, except in a few instances, satisfactory and encouraging. The observation of the officers of the Inspector-General's department is to the effect that "they have grown to realize that they are not independent organizations, but part of the military force of the State, amenable to its laws and subordinate to its regulations and discipline." This alone, without considering the improvement admitted to have been accomplished in matters of discipline and instruction, fully justifies the liberal appropriations made for the last two years. The reports show that there are still certain organizations which fall far short of the standard now reasonably required of the Guard; but, on the other hand, it will be seen that there are many notable examples of superior excellence; and there is a general disposition manifested to make the most of every opportunity to profit by military instruction, example and practice.

The Inspector-General reports that he does not consider the number present at the annual muster a fair indication of the effective and reliable strength of the organizations, for the reason that special efforts are made to bring men out on that occasion. This

is entirely true, and an organization should not be rated, either in strength or efficiency, according to its showing at the annual inspection and muster; but the work done at other times, especially in camp and at its weekly drills, should also be taken into consideration. The real standing of all the organizations, however, is pretty well understood, and spasmodic exhibitions of numbers, in cases where there is a meager and irregular attendance at company drills and schools of instruction, seldom impose on anybody. Nevertheless, it has been thought well to send inspecting officers to ascertain and report what the companies, those of regiments as well as separate companies, are doing, and this practice will be continued during the year.

Applications are constantly received for permission to raise separate companies of infantry, with an occasional request for authority to raise a battery. It is evident from an examination of these applications and the representations of those interested in them, that there would be no difficulty in filling up the ranks of the Guard to the limit of the statute, with men in every way as desirable as those generally found in the separate companies. It would seem to be in the interests of the service, and to the advantage of the State, to dispense promptly with inefficient and laggard organizations, and replace them with companies at important stations where men are anxious to enter the service. It is to be remembered in this connection, that our railroad facilities are such that troops can be readily moved whenever and wherever they may be needed.

It should be understood, however, that companies will be organized only in those localities where there are good military reasons for establishing them, and care should be exercised not to approach the legal limit as to the strength of the force so closely that it might become necessary to put a stop to recruiting, a thing which would undoubtedly be disastrous in its effects.

In last year's report no organization was distinguished by special mention. But this year the Seventh regiment has so eminently distinguished itself, that it would be unfair to refrain from awarding it conspicuous and honorable mention. The Twelfth regiment deserves mention for the great advance it is making under its present field officers. The Twenty-second gave evidence of its

soldierly and progressive character by marching from its station to the camp at Peekskill, and by practical instruction in field fortifications under Captain J. G. D. Knight, of the United States Engineers. The Twenty-third made an admirable showing at the Camp of Instruction in everything except numbers, and it is to be regretted that in this respect it contrasted so unfavorably with its appearance at the annual inspection. There are other regiments, and there are many separate companies, which merit commendation, but it is unnecessary to enumerate them, the Inspector-General having most plainly, fully and impartially set forth in his report the merits and demerits of each and every organization. Attention, however, may well be called to the batteries, which are in better form than at any time heretofore, and certainly deserve this recognition. Although until the time comes when they shall have their own horses, it cannot be expected of them to greatly excel as batteries of manœuvre, it should be remembered that such service will rarely be required of them. In the event of riotous disturbances there will hardly be any occasion for battery movements; the service of the piece would be the essential thing, and it is safe to say that all our batteries may be depended on to work their guns, in case of need, skilfully and effectively.

Not the least of the benefits which have now become apparent as resulting from the reorganization effected a little more than a year ago, as set forth in last year's report, were the opportunities and facilities it afforded to establish efficient examining boards for officers, and to prescribe a system of examination that should be uniform throughout the State. This was important, for the standard of "character, knowledge of military affairs and fitness for the service" of officers depends almost entirely upon the character and competency of the examining boards. Formerly there was a multiplicity of boards with a variety of systems, and whatever was done, it frequently happened as in many other matters, that it was so delayed and diluted by passing through various headquarters as to become of little value. There are now four boards of examination for officers, one in each brigade, the members of which have been carefully selected with reference to their qualifications for such service. They are working under and in accordance with established rules, and as the members are not

relieved from their regular duties, and as, moreover, the duty required of them is at best an irksome one, pay is allowed. They are doing excellent service and merit especial commendation.

ARMORIES.

I desire to ask your attention to the question of how to provide armories for the troops. The present system does not work satisfactorily, and it is believed that the subject demands serious consideration. The armory lies at the basis of our State system in military matters. In establishing a National Guard organization, almost the first thing to be considered is how to get a drill-room. The men, except on rare occasions, can only be assembled for drill and instruction in the evening, and necessarily, therefore, there must be a drill-room capable of being well lighted and heated, and there must also be a place where their arms, equipments, ammunition and uniforms can be safely kept while they are engaged in their occupations as citizens. In other words, there must be an armory or there will be no soldiers. More than this, the armory should be commodious and comfortable, as well as attractive in appearance and in its furnishings, in order to induce young men having military inclinations to enter the service.

Under the law, the counties are required to provide "suitable and convenient armories, drill-rooms and places of deposit for the safe keeping of arms, equipments, uniforms and other military property" furnished by the State. While some of the counties have been liberal enough in this respect, others have inclined to evade the duty. In the city and county of New York, the regiments and batteries, with only two exceptions, are huddled into contracted and uncomfortable barracks, which can in no sense be considered suitable and convenient drill-rooms, which afford plentiful facilities for the loss or destruction of public property, rather than its safe keeping, and which it is an absurdity to characterize as armories. The exceptions referred to are, the Seventh regiment, which built its own armory, and the Twelfth regiment, which has recently been put in possession of the only armory building erected by the county, and the only one fit for the occupation of troops that has been in any way provided by the county, at least for many years.

Notwithstanding the requirements of the law, special appropriations have been made from time to time, and armories have been erected with State moneys, in cases where the counties have provided suitable sites and conveyed the titles to them to the State. An effort made several years ago to procure similar legislation for New York regiments was opposed by those in authority in that city. It is recommended that as the troops are State troops, the State may well assume the whole burden of providing armories, or at least so amend the law that whenever there is an armory demanded, and the station is of sufficient military importance to warrant it, such measures may be taken that it cannot be left to the mercy of those who have no interest in the matter, save to delay or altogether avoid it.

Provision should be made, without unnecessary delay, for every organization that is not already properly quartered, having due consideration to its station and condition. The best armory in the State will not of itself make a good regiment, but the best officers in the State will find it difficult, under the conditions of National Guard service, to make a regiment in a barn. The situation of the New York city regiments and batteries particularly demands attention. Not only are they without suitable armory accommodations, but they are denied access to the parade ground laid out in Central Park for their use, on the ground that impossible injury would be done to the grass, and that shrubbery that does not exist in that vicinity would be destroyed. Some of these regiments are literally struggling to maintain an existence under the most discouraging circumstances. It is a question whether the expense incurred in maintaining them, is not, to a certain extent, an inexcusable waste of the military funds, and whatever military property is prudently allowed to remain in their so-called armories. There are among them those having histories of which they are justly proud, and which should be a source of strength to the State, but in the interests of economy it may well be suggested that if nothing is to be done to provide proper accommodations for them, the money and property could be more effectually applied in other quarters.

The following armories and arsenals have been erected under the authority of the acts of the Legislature named, and are now

the property of the State. In the greater number of instances they stand on land conveyed to the State by the counties:

Buffalo arsenal, chapter 630, Laws of 1857.

New York arsenal, chapter 630, Laws of 1857.

Rochester armory, chapter 630, Laws of 1857, and chapter 466, Laws of 1865.

Utica armory, chapter 630, Laws of 1857.

Syracuse armory, chapter 630, Laws of 1857.

Auburn armory, chapter 630, Laws of 1857.

Oswego armory, chapter 630, Laws of 1857.

Watertown armory, chapter 252, Laws of 1872.

Brooklyn armory, chapter 272, Laws of 1879.

Newburgh armory, chapter 272, Laws of 1879.

Kingston armory, chapter 272, Laws of 1879.

Binghamton armory, chapter 475, Laws of 1881.

Troy armory, chapter 100, Laws of 1883.

Flushing armory, chapter 491, Laws of 1883.

Oneonta armory, chapter 176, Laws of 1884.

Elmira armory, chapter 455, Laws of 1885.

Walton armory, chapter 429, Laws of 1885.

The following armories are now to be erected, under recent acts of the Legislature:

Saratoga Springs, chapter 621, Laws of 1886.

Mount Vernon, chapter 651, Laws of 1886.

Hoosick Falls, chapter 677, Laws of 1886.

Albany, chapters 165 and 319, Laws of 1886.

ARMS AND EQUIPMENTS.

The Remington rifle, with which the troops are armed, has been in constant use for more than fifteen years, and, considering the amount of work that has been done at the targets, it speaks well for its good qualities that it is still reported serviceable, or rather not unserviceable. It must, nevertheless, be regarded an obsolete arm, principally for the reason that its calibre is in excess of the present standard of the United States, and very much larger than that now used by military nations. It is to be regretted that it is still impossible to make any recommendation looking to the adoption of a new arm. There is no doubt that the United States

will sooner or later adopt the smaller calibre, and there can be little question that a magazine gun will also be adopted, but meantime the ordnance department of the army says, in substance, that it is waiting for the inventive genius of our people to discover something which will suit the purpose. As it is beyond dispute that it is important that the State troops should be armed with rifles of the same calibre as those used by the army, and if possible of the same pattern, there seems to be nothing for the State to do but to emulate the example of the United States ordnance department, and patiently wait the coming of the gun of the future.

The Gatling guns with which two of the batteries are armed are in good condition. The three-inch rifles and light twelve-pounders, which constitute the armament of the other batteries, have outlived their time, especially the light twelves, and the carriages and limbers are old and rotten. As soon as the United States Government will consent to issue the new three two-inch breech-loading rifle, with which it is about to arm all its mounted batteries, it is recommended that an earnest effort be made to procure a reasonable number of them.

The infantry has been supplied with new equipments which are believed to be entirely satisfactory. Having in view possible service in the field, there ought always to be on hand a large reserve supply of equipments with at least a double allowance of cartridge boxes, or cartridge belts. There should also be a reserve supply of haversacks and canteens, as well as blankets enough to furnish at least all the enlisted men now in service. This cannot be accomplished, however, unless special appropriations are made for the purpose. The knapsacks now issued are unsatisfactory, but until it is more definitely determined what equipment of this kind is better adapted to our service, it is not recommended that any change be made.

UNIFORMS.

Little can be added to what was said, or to the recommendations made, in the last report from this office on the subject of uniforms. By chapter 460 of the Laws of 1887, the Adjutant-General, Inspector-General and Chief of Ordnance, were constituted a commission to procure suitable overcoats, and the sum of $100,000 was appro-

priated for that purpose, $30,000 of which is immediately available and the balance at the expiration of one year from the execution of a contract to be made after due advertisement. A board of officers, convened to recommend such an overcoat as they should deem suitable for National Guard service, has reported. Advertisements have been published for bids for cloth, and although it is still doubtful whether the sum appropriated is sufficient to procure such overcoats as may reasonably be desired, there will be no unnecessary delay on the part of the commission, and it is hoped the issue of new overcoats may at least begin in the course of the coming summer.

CAMP OF INSTRUCTION.

Seven regiments, one battalion, nine separate companies and two batteries, performed tours of duty at the camp at Peekskill this season, as follows:

The Seventh regiment, Colonel Emmons Clark, from June eighteenth to June twenty-fifth.

The Twelfth regiment, Colonel James H. Jones, to whose command was attached the Seventeenth and Thirty-fifth separate companies, from June twenty-fifth to July second.

The Ninth regiment, Colonel William Seward, Jr., and a provisional battalion composed of the Sixth, Eleventh, Thirty-eighth and Forty-first separate companies, Major Frank A. Jones, of the Eleventh regiment, commanding, from July second to July ninth.

The Forty-seventh regiment, Colonel Edward F. Gaylor, and a provisional battalion composed of the Fifth, Nineteenth and Twentieth separate companies, and the Sixth battery serving as infantry, Major George A. Miller, of the Twenty-second regiment, commanding, from July ninth to July sixteenth.

The Twenty-third regiment, Lieutenant-Colonel Alexander S. Bacon, from July sixteenth to July twenty-third.

The Seventy-first regiment, Colonel Frederick Kopper, and the Tenth battalion, Lieutenant-Colonel William E. Fitch, from July twenty-third to July thirtieth.

The Twenty-second regiment, Colonel John T. Camp, and the Second battery, Captain Ferdinand P. Earle, from July thirtieth to August sixth.

A detachment of men from the First battery was sent to the

camp each week during the season, so that at the close of the encampment nearly all the enlisted men of the battery had performed the usual tour of duty.

The average attendance in camp this year was 74.27 per cent, not as much as heretofore, but still satisfactory; especially as the loss in attendance is easily explained by reference to the table annexed. The few changes that took place in the organizations, while in camp, deserve special notice and more than offset the apparent loss in attendance.

The total number of men who received pay for service in camp is 4,405. There were in at least one-half of the companies men who did not remain in camp long enough to entitle them to pay, and adding these will make the number in camp at least 4,450. The bands, no longer enlisted and therefore not included in the reports, numbered 250 men, making the aggregate in camp this season 4,700 officers, musicians and enlisted men. The details are shown in the following table:

ORGANIZATIONS.	ATTENDANCE.				Average officers and enlisted men.	Average per centage of attendance to the strength.	Number who received pay.
	HIGHEST REPORTED.		LOWEST REPORTED.				
	Officers.	Enlisted men.	Officers.	Enlisted men.			
Seventh Regiment	36	734	36	652	720	71.42	774
Twelfth Regiment	29	528	27	524	554	80.40	565
Seventeenth Separate Company	2	32	2	30	33	63.35	35
Thirty-fifth Separate Company	2	65	2	60	65	73.03	67
Ninth Regiment	30	365	28	356	388	66.42	398
Sixth Separate Company	3	80	3	75	81	77.88	83
Eleventh Separate Company	3	37	3	33	38	67.85	43
Thirty-eighth Separate Company	2	51	2	47	51	74.92	53
Forty-first Separate Company	3	53	3	50	55	76.40	56
Forty-seventh Regiment	24	311	24	305	332	73.45	345
Sixth Battery	3	54	3	53	56.8	84.85	57
Fifth Separate Company	3	63	3	62	65.3	93.28	66
Nineteenth Separate Company	4	81	4	76	82.8	82.30	84
Twentieth Separate Company	3	55	3	52	57	67.85	58
Twenty-third Regiment	36	375	36	339	394	56.93	417
Seventy-first Regiment	28	381	27	376	406	69.46	416
Tenth Battalion	15	181	15	174	192	73.28	196
Twenty-second Regiment	39	466	37	437	487	83.10	509
Second Battery	4	76	4	73	78.7	74.96	82
First Battery, detachm'ts equivalent to	..	....	..	....	.....	.....	101
							4,405

Reviewing the encampment since 1882, every one shows improvement over the preceding one, especially in the matters of military conduct, military courtesy, discipline and police. In these

particulars, such is the progress made that, with the exception of a very limited number of organizations, there is little left to criticise. Drill is improving, but there is much theoretical and practical instruction needed yet. Guard duty has improved, but there is room for further improvement, and there is evidently a lack of that careful theoretical instruction which is absolutely essential in this matter. The idea that the State puts troops in camp for the purpose of giving them a holiday after a winter's work in the armories, has almost disappeared, and no one more than the troops themselves are entitled to be congratulated that it is so.

The government of the camp as a military post, established the previous season, was continued this year. Several officers were detailed as inspectors and instructors, as is shown by the orders which are made a part of this report, and they performed their duties in the most satisfactory manner; nevertheless the same difficulty in obtaining desirable officers, who could give the required time for this service, was experienced that was mentioned in last year's report. As it appears to be the only way in which the difficulty can be met, and as it has also become apparent that there is a further demand for officers to make frequent inspections, and observe the work of the various organizations at their armories, the suggestion that a staff of thoroughly trained officers be placed permanently on duty, and allowed suitable compensation, is renewed. There can be no question that in order to secure thorough, systematic and uniform instruction, as well as uniformity in the practices and customs of the service, there should be as little change as possible in the officers having charge of affairs at the camp of instruction. At least there should be no change in the commanding officer or the staff, or the system of instruction, in the course of an encampment season.

Soon after the establishment of the camp at Peekskill there was developed a tendency to compress all the instruction of the year, including drilling of recruits, the school of the company, target practice and competitions for the marksman's and sharpshooter's decorations, as well as the annual inspection and muster, into the seven days of the encampment. To suffer this was to do violence to the theory upon which the camp of instruction was organized,

as well as the State system in the matter of armories. The camp of instruction is intended to supplement instruction of the armories. The schools of the soldier and the company can be as well, or even better taught in the armory, and more will be accomplished in rifle practice at the regular ranges than at the camp, with all its continuous and conflicting duties. Besides, the cost is to be taken into consideration; for to put troops in camp to do armory work would be an unjustifiable expenditure. All this has now become well understood, and so far as may be hereafter, having reference to their drill-room facilities, organizations will not be ordered to the camp that have not made reasonable progress in their armories.

Colonel E. F. Townsend, Twelfth infantry, U. S. A., and Major R. Lodor, Third artillery, U. S. A., under orders from the headquarters of the army, were present at the camp and inspected the troops. For further information in regard to the encampment this season, reference is respectfully made to their reports to the Adjutant-General, U. S. A., copies of which are forwarded herewith.

MOVEMENTS OF TROOPS.

The Fourteenth and Sixty-ninth regiments were detailed, in accordance with chapter 488, Laws of 1887, as an escort, under the command of Brigadier-General James McLeer, to the society of the Army of the Potomac, at its reunion at Saratoga, June twenty-second, this year. These regiments were selected for this duty on account of their connection with the Army of the Potomac, and they did credit to the selection. At the centennial celebration of the adoption of the Federal Constitution, held at Philadelphia, the State was represented by a brigade commanded by Brigadier-General Louis Fitzgerald, and composed of the Twelfth, Twenty-second and Twenty-third regiments, and a provisional regiment formed of the Second, Eighth, Nineteenth, Twentieth, Twenty-second, Twenty-sixth, Thirtieth, Thirty-second, Thirty-fifth, Thirty-ninth and Forty-first separate companies, under the command of Colonel E. F. Gaylor, of the Forty-seventh regiment. These troops took part in the parade on the sixteenth of September ultimo, and by their military bearing and soldierly conduct reflected the highest credit on the State.

The experience gained on such tours of duty cannot fail to be of great value to the troops. It would be in the interests of all concerned if every summer a brigade should be ordered away for a day or two, when a short march might possibly be combined with transportation by rail. To successfully conduct an ordinary march or a march by rail, is a more difficult matter than it seems, and the knowledge necessary to its skillful accomplishment is only thoroughly acquired by actual experience.

BUREAU OF RECORDS OF THE WAR OF THE REBELLION.

It is satisfactory in this connection to recite the acts of the Legislature, relating to honorably discharged soldiers and sailors, which, with your approval, have become laws of the State, inasmuch as they unequivocally show the appreciation in which those who served in a field or on the sea, in the war for the Union, are held.

Chapter 8, Laws of 1885, prevents persons from unlawfully using or wearing the badge of the Grand Army of the Republic of this State.

Chapter 24, Laws of 1885, amends the act authorizing the burial of any honorably discharged soldier, sailor or marine, who shall hereafter die without leaving means sufficient to defray the funeral expenses, and makes it more liberal in its terms.

Chapter 240, Laws of 1885, provides that the orderlies and watchmen employed at the Capitol, shall be persons who served in the Union army or navy during the late war, and have been honorably discharged therefrom, and that they shall not be subject to civil service rules of examination.

Chapter 29, Laws of 1886, provides that persons who served in the army or navy of the United States in the late war, and have been honorably discharged therefrom, shall be preferred for appointment to positions in the civil service, and shall not be disqualified from holding any position in civil service on account of age or any physical disability, as long as such do not render them incompetent to perform the duties of the position applied for.

Chapter 173, Laws of 1886, empowers the boards of supervisors of the several counties of the State to vote moneys for the

erection, repairing or remodeling of monuments to the veterans of the rebellion.

Chapter 422, Laws of 1886, exempts honorably discharged soldiers and sailors who lost an arm or a leg in the service of the United States during the late war, or who are unable to perform manual labor by reason of injuries received or disabilities incurred in such service, from work on highways or assessments therefor.

Chapter 102, Laws of 1887, authorizes the county of Ulster to aid in erecting a memorial soldiers' monument.

Chapter 195, Laws of 1887, repeats the provisions of chapter 240, Laws of 1885, already quoted.

Chapter 214, Laws of 1887, amends the burial acts already in existence, making them still more liberal.

Chapter 269, Laws of 1887, provides for the erection of suitable monuments to the memory of the soldiers of the State of New York who were engaged in the battle of Gettysburg.

Chapter 291, Laws of 1887, gives preference to the children of those who have died in the military or naval service of the United States in free tuition at Cornell University.

Chapter 339, Laws of 1887, authorizes the erection of a soldiers' and sailors' monument in the city of Brooklyn, and provides for payment therefor.

Chapter 464, Laws of 1887, repeats and enlarges the provision of chapter 29, Laws of 1886, relating to the employment of honorably discharged Union soldiers or sailors in the public service of the State.

Chapter 706, Laws of 1887, provides for the relief of indigent soldiers, sailors and marines, and the families of those deceased, enabling the poor old soldier to spend the evening of his days with his family, and when the final night comes to go to sleep tended by loving hands, instead of dying in the poor-house, or far from family or friends in the Soldiers' Home.

There are other acts, but as they are more local than general they are not mentioned.

These acts show how well the interests of the soldier have been looked after under your administration, but there is one more to be recorded. The State has no complete record of those who served in the war, and a bill embodying the provisions of chapter

51, Laws of 1887, was prepared and introduced in the Legislature, where it passed, and receiving your approval, became a law. It provides for the completion of the records of New York volunteers of the war of the rebellion, on file in this office.

Later in the session you approved chapter 247, Laws of 1887, entitled "An act in relation to the collection and preservation of the battle flags, of records and relics of New York volunteers who served in the war of the rebellion."

Chapters 51 and 247, the two last mentioned, are the ones which affect this Department directly. In accordance with chapter 51, arrangements have been made with the Adjutant-General of the U. S. A., so that copies of the missing records of New York volunteers will be received from him; and if the arrangements prove satisfactory, it is estimated that in the course of the coming year copies of almost all the missing records will be placed on file in this office.

Under chapter 247, Laws of 1887, a bureau of military records has been established in this office, the former volunteer division of the office forming part of it. Colonel Frederick Phisterer has been detailed as chief of the bureau, and Mr. Gilbert C. Rice as his assistant, both having been for several years connected with the former volunteer division.

Application has been made to the trustees of the Capitol for suitable and convenient quarters for this bureau, and until such are provided its operations are necessarily confined to furnishing information from the records on file to those entitled thereto, and to perfecting those records as far as practicable.

To carry out the provisions of chapters 51 and 247, Laws of 1887, continued appropriations, proper and suitable quarters and some changes in chapter 247 will be necessary.

The labors heretofore performed by the volunteer division of this office, now performed by the Bureau of Records, have not decreased since my last report.

The annual reports of the Inspector-General, the Chief of Ordnance, acting Quartermaster-General and acting Commissary-General of Subsistence, the Surgeon-General, the General Inspector of Rifle Practice and the acting Paymaster-General, are submitted herewith.

The annual report of the commanding officer of the First Brigade, the report of the same officer as commanding officer of the provisional brigade at Philadelphia, and the report of Major General J. G. Farnsworth on the condition of the war claims of the State against the United States, are also submitted with this report.

Very respectfully,

Your obedient servant,

JOSIAH PORTER,

Adjutant-General

APPENDICES ACCOMPANYING THIS REPORT.

A. Register of Commissioned Officers of the National Guard.

B. Report on State Camp by Col. E. F. Townsend, Twelfth United States Infantry, and Major R. Lodor, Third United States Artillery.

C. General Orders and Circulars, and Opinions of the Judge-Advocate-General.

D. Report of the Inspector-General.

E. Report of the Chief of Ordnance.

F. Report of the Surgeon-General.

G. Report of the Surgeon, Twenty-second Regiment.

H. Report of the Acting Paymaster-General.

I. Report of the General Inspector of Rifle Practice.

J. Reports of Brig.-Gen. Louis Fitzgerald on First Brigade and Provisional Brigade.

K. Report of Gen. J. G. Farnsworth on War Claims.

L. Statement of Disbursements.

OFFICIAL REGISTER

OF THE

NATIONAL GUARD, STATE OF NEW YORK,

JANUARY 8, 1888.

Errors and omissions should immediately be reported to the Adjutant-General by the officers concerned.

Only the highest brevet rank is given, and that only when the officer has not attained the full rank.

The numbers placed after the names of general and departmental staff officers on pages 30 to 44, indicate the number of the brigade with which they are on duty.

Commander-in-Chief:

DAVID B. HILL, OF ELMIRA,

Governor of the State.

HEADQUARTERS, ALBANY.

Staff of the Commander-in-Chief:

Major-General Josiah Porter, Adjutant-General.
Brigadier-General Daniel D. Wylie, Chief of Artillery.
Brigadier-General Charles F. Robbins, General Inspector of Rifle Practice.
Brigadier-General Joseph D. Bryant, Surgeon-General.
Brigadier-General George S. Field, Engineer-in-Chief.
Brigadier-General Joshua M. Varian, Chief of Ordnance.
Brigadier-General Frank M. Freeman, Quartermaster-General.
Brigadier-General William M. Ivins, Judge-Advocate-General.
Brigadier-General Emil Schaefer, Inspector-General.
Brigadier-General Ralph Brandreth, Commissary-General of Subsistence.
Colonel John V. L. Pruyn, Aide-de-Camp.
Colonel Hugh O'Donoghue, Aide-de-Camp.
Colonel Albert B. Hilton, Aide-de-Camp.
Colonel Edmund L. Judson, 2d, Aide-de-Camp.
Colonel Charles E. Walker, Aide-de-Camp.
Colonel John F. Gaynor, Aide-de-Camp.

The National Guard, consisting of five batteries of artillery, fifteen regiments, one battalion, and forty-four separate companies of infantry, organized in four brigades.

First Brigade.

Headquarters, No. 6 Pine street, New York city.

Brigadier-General LOUIS FITZGERALD, Commanding.

Lieutenant-Colonel Robert W. Leonard, Assistant Adjutant-General.
Major Stephen H. Olin, Judge-Advocate.
Major C. Lawrence Perkins, Commissary of Subsistence.
Major Robert V. McKim, Surgeon.
Major Paul Dana, Ordnance Officer.
Major Auguste P. Montant, Inspector.
Major Wendel Goodwin, Quartermaster.
Major Clarence H. Eagle, Inspector of Rifle Practice.

Captain W. Emlen Roosevelt, Aide-de-Camp.

Captain Francis R. Appleton, Aide-de-Camp.

The First and Second Batteries, the Seventh, Eighth, Ninth, Eleventh, Twelfth, Twenty-second, Sixty-ninth and Seventy-first Regiments of Infantry.

Attached to the Brigade Staff, Supernumerary Officers:

Lieutenant-Colonel Benjamin S. Church, as Engineer.

Major Edmund C. Stanton, as Signal Officer.

Second Brigade.

Headquarters, Hall of Records, Brooklyn.

Brigadier-General JAMES MCLEER, Commanding.

Lieutenant-Colonel John B. Frothingham, Assistant Adjutant-General.

Major Gustave A. Jahn, Inspector.

Major George L. Fox, Inspector of Rifle Practice.

Major Frank Lyman, Engineer.

Major William Cary Sanger, Quartermaster.

Major George Kinkel, Jr., Ordnance Officer.

Major George R. Fowler, Surgeon.

Major Almet F. Jenks, Judge-Advocate.

Major Fritz Brosè, Commissary of Subsistence.

Captain Francis D. Beard, Aide-de-Camp.

The Third Battery, the Thirteenth, Fourteenth, Twenty-third, Thirty-second and Forty-seventh Regiments, and Seventeenth Separate Company of Infantry.

Attached to the Brigade Staff, Supernumerary Officer:

Captain Frederick T. Leigh, as Signal Officer.

Third Brigade.

Headquarters, Albany.

Brigadier-General AMASA J. PARKER, Jr., Commanding.

Colonel John S. McEwan, Assistant Adjutant-General of the State, acting as Assistant Adjutant-General of the Brigade.

Major Charles H. Stott, Jr., Quartermaster.

Major Albert Hoysradt, Judge-Advocate.

Major Elwood O. Roessle, Commissary of Subsistence.

Major Herman Bendell, Surgeon.

Major Patrick F. Bulger, Ordnance Officer.

Major Charles H. Gaus, Inspector of Rifle Practice.

Captain Charles J. Peabody, Aide-de-Camp.

Captain Hobart Warren Thompson, Aide-de-Camp.

The Sixth Battery, the Tenth Battalion, the Third, Fourth, Fifth, Sixth, Seventh, Ninth, Tenth, Eleventh, Twelfth, Fourteenth, Fifteenth, Sixteenth, Eighteenth, Nineteenth, Twentieth, Twenty-First, Twenty-second, Twenty-third, Twenty-fourth, Twenty-seventh, Twenty-eighth, Thirty-first, Thirty-second, Thirty-third, Thirty-fifth, Thirty-sixth, Thirty-seventh, Thirty-ninth and Forty-fourth Separate Companies of Infantry.

Attached to the Brigade Staff, Supernumerary Officers:

Colonel David M. Greene, as Engineer.

Major Frederick B. Spriggs.

Major Edward L. Gaul.

Fourth Brigade.

Headquarters, 474 Main street, Buffalo.

Brigadier-General PETER C. DOYLE, Commanding.

Major Edward S. Warren, Quartermaster.

Major Edmund Hayes, Engineer.

Major Roswell Park, Surgeon.

Major Herbert P. Bissell, Judge-Advocate.

Major Alan H. G. Hardwicke, Inspector of Rifle Practice.

Major Frederick A. Jewett, Ordnance Officer.

Major Nathaniel Rochester, Inspector.

Major Edson J. Weeks, Commissary of Subsistence.

Captain Francis R. Keating, Aide-de-Camp.

Captain Charles R. Wilson, Aide-de-Camp.

The Fifth Battery, the Sixty-fifth and Seventy-fourth Regiments, and the First, Second, Eighth, Thirteenth, Twenty-fifth, Twenty-sixth, Twenty-ninth, Thirtieth, Thirty-fourth, Thirty-eighth, Fortieth, Forty-first, Forty-second, and Forty-third Separate Companies of Infantry.

Attached to the Brigade Staff, Supernumerary Officer:

Lieutenant-Colonel Charles Clifton.

GENERAL OFFICERS.

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Brigadier-Generals.			
Louis Fitzgerald (1), March 28, 1882,	Sergeant, Co. C, 7th Regt., N.Y. S. militia, in U. S. service from April 19 to June 3, 1861; First Lieutenant 11th N.Y. vols., June 2, 1861; Captain, July 21, 1861; resigned September 1, 1861: Adjutant 40th N. Y. vols., Jan. 24, 1862; Captain, May 26, 1862; Provost Marshal and Aid-de-Camp, Kearney's and Birney's 1st Division; Aid-de-Camp to Major General Foster, 18th Army Corps; discharged July 6, 1864; Major and later Lieutenant-Colonel 1st Regt. militia, district of Vicksburg, Miss., and discharged in February, 1865.	Private, Co. C, 7th Regt., Dec. 30, 1857; Corporal, Jan. 4, 1860 Sergeant, Feb. 4, 1860: vacated by entry in U. S. service, June 3, 1861: Second Lieutenant, 7th Regt., Sept. 23, 1861; First Lieutenant, Co. E, Dec. 6, 1861: vacated office by enlisting in N.Y. vols., Jan., 1862: First Lieutenant, Co. E, 7th Regt., Oct. 14, 1865; Adjutant 7th Regt., May 1, 1867; Lieutenant-Colonel Nov. 9, 1876; Brigadier-General March 28, 1882: Supernumerary Aug. 5, 1886; Brigadier-General 1st Brigade Aug. 26, 1886, with original rank.	N. Y.
James McLeer (2), Oct. 13, 1885....	Private, Co. C, 14th N. Y. S. militia (84th vols.), April 18, 1861; discharged as Sergeant (loss of left arm), July 27, 1863; Brevet Captain N. Y. S. vols.	Private, Co. C, 14th Regt., April 18, 1861; discharged as Sergeant July 27, 1863: First Lieutenant Co. C, 14th Regt., May 27, 1865; Quartermaster, 14th Regt., Sept. 9, 1867; Major Aug. 16, 1869; Lieutenant-Colonel November 7, 1870: Colonel June 6, 1873; Brigadier-General 3d Brigade, Oct. 13, 1885; Supernumerary Aug. 5, 1886; Brigadier-General 2d Brigade, Aug. 26, 1886, with original rank.	N. Y.

Peter C. Doyle (4), Jan. 16, 1886....	Quartermaster-Sergeant, 21st N. Y. vols., May 20, 1861; Second Lieutenant, Oct. 1, 1861; First Lieutenant, May 6, 1862; Captain, Sept. 9, 1862; honorably discharged May 18, 1863; Brevet Major N. Y. vols.	Private, Co. B, 74th Regt., Nov. 12, 1856; Aid-de-Camp, 31st Brigade, April 4, 1865; Assistant Adjutant-General, May 1, 1867; resigned Feb. 26, 1868: Engineer 14th Brigade, June 11, 1878; resigned April 24, 1880; Colonel and Assistant Commissary-General of Subsistence, July 21, 1883; Brigadier-General 8th Brigade, Jan. 16, 1886; Supernumerary Aug. 5, 1886; Brigadier-General 4th Brigade, Aug. 30, 1886, with original rank.	N. Y.
Amasa J. Parker, Jr. (3), Aug. 25, 1886.....	.....	Aid-de-Camp, 3d Division, Sept. 1, 1866; Supernumerary May 4, 1867; Lieutenant-Colonel 10th Regiment, June 15, 1875: Colonel July 23, 1877; resigned March 1, 1880; Brigadier-General 3d Brigade, Aug. 25, 1886.	N. Y.

ADJUTANT-GENERAL'S DEPARTMENT.

Adjutant-General—Major-General.			
Josiah Porter, Jan. 1, 1886.....	First Lieutenant, 1st Mass. Battery. April, 1861 (Battery A, Mass. vol. artillery); Captain, July, 1861; honorably discharged Sept. 27, 1862.	Private, Boston Cadets; First Lieutenant, Boston City Guard; Adjutant, Ancient and Honorable Artillery, Boston, Mass.; Captain, 22d Regt. N. G. S. N. Y., June 13, 1865; Major, May 10, 1867; Lieutenant-Colonel, Jan. 30, 1869: Colonel, Oct. 11, 1869; Major-General and Adjutant-General, Jan. 1, 1886.	Mass
Assistant Adjutant-General—Colonel.			
John S. McEwan, Jan. 1. 1880	First Lieutenant, 113th N. Y. vols., Aug. 8, 1862; Captain, 7th N. Y. vol. art., late 113th vols., Jan. 16, 1864; resigned June 1, 1866; Brevet-Colonel, N. Y. vols.; Second Lieutenant, 4th U. S. artillery, Aug. 17, 1867; resigned December 15, 1872; Brevet-Captain, U. S. army.	Private Co. A, 10th Regt., 1861; Major, 10th Regt., July 23, 1877; Lieutenant-Colonel, Aug. 27, 1879; Colonel and Assistant Adjutant-General, Jan. 1, 1880.	Scot.

ADJUTANT-GENERAL'S DEPARTMENT—*(Continued).*

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Acting Assistant Adjutant-General—Colonel.			
Frederick Phisterer, Jan. 1, 1880...	Private, Company A, 3d U. S. artillery, Dec. 6, 1855; Corporal, Oct. 12, 1858; Sergeant, July 10, 1860; honorably discharged Dec. 6, 1860; Sergeant-Major, 18th U. S. infantry, July 31, 1861; Second Lieutenant, Oct. 30, 1861; First Lieutenant, Feb. 27, 1862; Captain, Feb. 15, 1866; transferred to 36th U. S. infantry July 28, 1866; transferred to 7th U. S. infantry March 3, 1869; honorably discharged Aug. 4, 1870.	Captain, Governor's Guard, O. N. G., Aug. 27, 1877; resigned Jan. 27, 1879; Colonel and Acting Assistant Adjutant-General, S. N. Y., Jan. 1, 1880.	Ger.
Assistant Adjutants-General of Brigade—Lieutenant-Colonels.			
John B. Frothingham (2), April 11, 1881; Brevet-Colonel, June 22, 1883.....	Private, 5th Massachusetts vol. militia, three months' service, May to July, 1861.	Private, 23d Regt., Dec. 3, 1869; Corporal, March 4, 1870; Sergeant, Jan. 3, 1872; Adjutant, April 6, 1874; Major, Jan. 10, 1880; Lieutenant-Colonel, April 11, 1881, and Adjutant-General 3d Brigade, March 31, 1886, with original rank; Supernumerary, Aug. 5, 1886; Assistant Adjutant-General, 2d Brigade, with original rank.	Mass

Robert W. Leonard (1), Oct. 6, 1887.	Private, Company B, 7th militia, April 19 to June 3, 1861, and May 26 to Sept. 5, 1862.	Private, Co. B, 7th Regt., May 7, 1860 to Sept. 11, 1862; Adjutant, 4th Regt., Nov. 17, 1865: Major, April 18, 1867; Brevet Lieutenant-Colonel, Dec. 10, 1867; Commissary of Subsistence, 7th Regt., Feb. 1, 1868; Major and Inspector, Cavalry Brigade, Jan. 2, 1869; Lieutenant-Colonel and Assistant Adjutant-General, Cavalry Brigade, Jan. 26, 1870; Supernumerary by disbandment, Dec. 2, 1870; Captain, 27th Regt., Aug. 9, 1875; Supernumerary by disbandment, Nov. 22, 1878; Lieutenant-Col. and Assistant Adjutant-General, 1st Brigade, Oct. 6, 1887.	Ills.

INSPECTOR-GENERAL'S DEPARTMENT.

Inspector-General—Brigadier-General.			
Emil Schaefer, Jan. 1, 1886		Private, 7th Regt., Oct. 20, 1880; Corporal, May 4, 1883; Sergeant, Aug. 7, 1885; Brigadier-General and Inspector-General, Jan. 1, 1886.	N. Y.
Assistant Inspectors-General—Colonel.			
Thomas H. McGrath, Feb. 7, 1884.	Corporal, 13th Regt., N. G., S. N. Y., three months' service in 1862; Sergeant 13th Regt., N. G., S. N. Y., thirty days' service, 1863.	Private, 13th Regt., Militia, Nov. 22, 1861; Corporal, May 28th, 1862; Sergeant, June 20, 1863; First Sergeant, June 8, 1864; Second Lieutenant, Oct. 11, 1865; First Lieutenant, Feb. 4. 1868; Captain, Sept. 25, 1873; honorably discharged Feb. 19, 1874; Major and Assistant in Inspector-General's Department, June 24, 1875; Lieutenant-Colonel, June 9, 1879; resigned March 1, 1880; Lieutenant-Colonel and Assistant in Inspector-General's Department, Jan. 1, 1883; Assistant Inspector-General, Feb. 7, 1884.	N. Y.

INSPECTOR-GENERAL'S DEPARTMENT — (*Continued*).

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Lieutenant-Colonel.			
Frederick C. McLewee, Jan. 12, 1886		Private, Co. F, 22d Regt., March 14, 1872; Corporal, Dec. 9, 1873; honorably discharged July 9, 1877; Private, Co. C, 7th Regt., July 11, 1877; Corporal, June 19, 1878; Sergeant, Oct. 1, 1880; First Sergeant, May 17, 1882; Second Lieutenant, Feb. 25, 1884; Lieutenant-Colonel and Assistant Inspector-General, Jan. 12, 1886.	N. Y.
Inspectors of Brigades — Major.			
Gustave A. Jahn (2), April 23, 1883.	Corporal, Co. K, 13th Regt., N. G. S. N. Y., June 20 to July 20, 1863.	Private, Co. K, 13th Regt., June 4, 1863; Corporal, June 20, 1863; First Lieutenant and Commissary of Subsistence, Aug. 8, 1877; Captain and Commissary of Subsistence, 3d Brigade, July 22, 1880; Major and Commissary of Subsistence, April 23, 1883; Supernumerary, Aug. 5, 1886; Commissary of Subsistence, 2d Brigade, original rank, Oct. 5, 1886; Major and Inspector, original rank, July 23, 1887.	Fr.
Auguste P. Montant (1), May 14, 1884		Private, Co. K, 7th Regt., Sept. 5, 1879; Major and Quartermaster, 2d Brigade, May 14, 1884; Supernumerary, Aug. 5, 1886; Inspector, 1st Brigade, Oct. 3, 1886, with original rank.	N. Y. Ger.
Nathaniel Rochester (4), April 26, 1887		Major and Inspector, 4th Brigade, April 26, 1887.	

JUDGE-ADVOCATE-GENERAL'S DEPARTMENT.

Judge-Advocate-General— Brigadier-General.			
William M. Ivins, Jan. 1, 1886		Major and Judge-Advocate, 5th Brigade, June 16, 1876; Lieutenant-Colonel and Judge-Advocate, 2d Division, July 26, 1880; resigned Dec. 3, 1880; Brigadier-General and Judge-Advocate-General, Jan. 1, 1886.	N. Y.

Assistant Judge-Advocate-General—Lieutenant-Colonel.		
William W. Ladd, Jr., Feb. 25, 1887	Lieutenant-Colonel and Assistant Judge-Advocate-General, Feb. 25, 1887.	N. Y.
Judge-Advocates of Brigade—Majors.		
Stephen H. Olin (1), April 24, 1882	Major and Judge-Advocate, 2d Brigade, April 24, 1882; Supernumerary, Aug. 5, 1886; Judge-Advocate, 1st Brigade, Oct. 3, 1886, with original rank.	Conn
Albert Hoysradt (3), Jan. 31, 1883	Major and Judge-Advocate, 5th Brigade, Jan. 31, 1883; Supernumerary, Aug. 5, 1886; Judge-Advocate, 3d Brigade, Oct. 13, 1886, with original rank.	N. Y.
Herbert P. Bissell (4), Aug. 25, 1885	Major and Judge-Advocate, 8th Brigade, Aug. 25, 1885; Supernumerary Aug. 5, 1886; Judge-Advocate, 4th Brigade, Sept. 7, 1886, with original rank.	N. Y.
Almet F. Jenks (2), Oct. 4, 1886	Major and Judge-Advocate, 2d Brigade, Oct. 4, 1886.	N. Y.

QUARTERMASTER'S DEPARTMENT.

Quartermaster-General—Brigadier-General.		
Frank Morgan Freeman, Jan. 1, 1886	Private, Co. F, 7th Regt., May 2, 1879; First-Lieutenant and Aide-de-Camp, 3d Brigade, December 27, 1881; Captain and Aide-de-Camp, April 23, 1883; Brigadier-General and Quartermaster-General, Jan. 1, 1886.	N. Y.
Assistant Quartermaster-General—Colonel.		
Henry Frost Clark, Jan. 26, 1886	Private, Co. A, 21st Regt., Oct. 27, 1862; 2d Lieutenant, May 10, 1864; Captain, May 30, 1867; honorably discharged, Nov. 25, 1869; Quartermaster, 21st Regt., Jan. 20, 1870; Adjutant, July 20, 1872; Lieutenant-Colonel, Apr. 26, 1876; honorably discharged, Nov. 18, 1878; Inspector of Rifle Practice, 5th Brigade, Jan. 31, 1883; resigned, May 3, 1884; Colonel and Assistant Quartermaster-General, Jan. 26, 1886.	N. Y.

QUARTERMASTER'S DEPARTMENT — (*Continued*).

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Quartermasters of Brigade—Majors.			
Charles H. Stott, Jr. (3), May 18, 1880,		Supernumerary Officer, on duty as Aide-de-Camp with 3d Division; Supernumerary, Aug. 5, 1886; Quartermaster, 3d Brigade, with original rank, Oct. 13, 1886.	.....
Edward S. Warren (4), Apr. 22, 1884		First-Lieutenant and Aide-de-Camp, Nov. 10, 1879; Captain and Aide-de-Camp, 14th Brigade, Dec. 2, 1880; Major and Quartermaster, April 22, 1884; Supernumerary. August 5, 1886; Quartermaster, 4th Brigade, Sept. 7, 1886, with original rank.	N. Y.
Wendel Goodwin (1), Feb. 28, 1885..		Private, Independent Corps Cadets, Boston, Mass., 1872; Provost Sergeant, 2d Brigade, Mass. Vol. Militia, 1876; Provost Marshal and Captain, Apr. 16, 1881; resigned, Mar. 3, 1882; Inspector and Major, 2d Brigade, May 22, 1882; resigned, Nov. 13, 1883; Major and Commissary of Subsistence, 2d Brigade, Feb. 28, 1885; Supernumerary, Aug. 5, 1886; Quartermaster, 1st Brigade, Oct. 3, 1886, with original rank.	N. H.
Wm. Cary Sanger (2), Jan. 4, 1886..		Major and Quartermaster, 2d Brigade, Jan. 4, 1886.	N. Y.

SUBSISTENCE DEPARTMENT.

Commissary-General of Subsistence—Brigadier-General.			
Ralph Brandreth, Jan. 1, 1886.....		Brigadier-General and Commissary-General of Subsistence, Jan. 1, 1886.	N. Y.

Captain and Assistant in Subsistence Department.			
Joseph P. Jardine, May 25, 1887	As Private, 22d N. G. S. N. Y., from May 28 to Sept. 5. 1862; as Private, June 18 to July 24, 1863.	Private, Co. G, 22d Regt., Sept. 17, 1861; Corporal, Dec. 28, 1866; Commissary of Subsistence, 22d Regt., April 10, 1877; Captain and Assistant in Subsistence Department, May 25, 1887.	Eng.
Commissaries of Subsistence of Brigade—Majors.			
C. Lawrence Perkins (1), May 22, 1882		Major and Engineer, 2d Brigade, May 22, 1882; Supernumerary, Aug. 5, 1886; Commissary of Subsistence, 1st Brigade, Oct. 3, 1886, with original rank.	Eng.
Elwood O. Roessle (3), Sept. 8, 1886,		Major and Commissary of Subsistence, 3d Brigade, Sept. 8, 1886.	N. Y.
Fritz Brosé (2), July 5, 1887		Private. Co. D, 23d Regt., Jan. 5, 1880: Corporal Feb. 20, 1882; Captain and Aide-de-Camp, 3d Brigade, Jan. 26, 1885; Supernumerary, Aug. 5, 1886; appointed Aide-de-Camp, 2d Brigade, with original rank, Dec. 24, 1886; Major and Commissary of Subsistence, 2d Brigade, July 5, 1887.	N. Y.
Edson J. Weeks (4), Oct. 18, 1887		Major and Commissary of Subsistence, 4th Brigade, Oct. 18, 1887.	N. Y.

MEDICAL DEPARTMENT.

Surgeon-General—Brigadier-General			
Joseph D. Bryant, Jan. 1, 1883		Major and Surgeon, 71st Regt., July 22, 1873: Surgeon-General, Jan. 1, 1883.	N. Y.
Assistant in the Department—First Lieutenant.			
Albert L. Behan, Feb. 21, 1885		First Lieutenant and Assistant Surgeon, Med. Dept., on duty with 25th Separate Co., S. O., No. 19, A. G. O., Feb. 28, 1885.	N. Y.
Surgeons of Brigades—Majors.			
Robert V. McKim (1), March 5, 1883,	Assistant Surgeon, 57th N. Y. vols., Oct. 22, 1861; Surgeon, Feb. 20, 1862: honorably dis- December 3, 1862.	Major and Surgeon, 2d Brigade, March 5, 1883; Supernumerary, Aug. 5, 1886; Surgeon, 1st Brigade, Oct. 3, 1886, with original rank.	N. Y.

MEDICAL DEPARTMENT—(*Continued*).

NAME, GRADE AND DATE OF RANK.	SERVICE. In the Armies of the United States.	SERVICE. In the National Guard.	Born.
Roswell Park (4), May 6, 1884		Major and Surgeon, 8th Brigade, May 6, 1884; Supernumerary, Aug. 5, 1886; Surgeon, 4th Brigade, Sept. 7, 1886, with original rank.	Conn.
George R. Fowler (2), June 2, 1886		Captain and Assistant Surgeon, 14th Regt., June 4, 1877; Major and Surgeon, 14th Regt., June 2, 2, 1886; Surgeon, 2d Brigade, Oct. 5, 1886, with rank from June 2, 1886.	.....
Herman Bendell (3), Sept. 8, 1886	Assistant Surgeon, 6th N. Y. vol. Artillery, Feb. 23, 1863; Surgeon, 86th N. Y. vols., Dec. 26, 1864: resigned May 25, 1865; Brevet-Col. N. Y. vols.	Major and Surgeon, 3d Brigade, Sept. 8, 1886.	N. Y.

PAY DEPARTMENT.

Assistant Paymaster-General—Colonel.			
Edw'd B. Ten Broeck, Mar. 21, 1885		Private, Co. A, 10th Regt., May 9, 1870; Corporal, Jan. 8, 1872; Sergeant, Dec. 2, 1872; Second Lieutenant, Feb. 16, 1874; First Lieutenant, Oct. 18, 1875; discharged Feb. 26, 1879; Colonel and Assistant Paymaster-General, March 21, 1885.	N. Y.

ENGINEER DEPARTMENT.

Engineer-in-Chief—Brigadier-General.			
George S. Field, Jan. 1, 1883		Brigadier-General and Engineer-in-Chief, Jan. 1, 1883.	N. Y.

Engineers of Brigades—Majors.			
Edmund Hayes (4) April 22, 1884		Major and Engineer, 8th Brigade, April 22, 1884; Supernumerary, Aug. 5, 1886; Engineer 4th Brigade, Sept. 7, 1886, with original rank.	Me.
Frank Lyman (2), Jan. 4, 1886		Major and Engineer, 3d Brigade, Jan. 4, 1886; Supernumerary, Aug. 5, 1886; Engineer, 2d Brigade, Oct. 5, 1886, with original rank.	N. Y.

ORDNANCE DEPARTMENT.

Chief of Ordnance (Commissary-General)—Brigadier-General.			
Joshua M. Varian, Jan. 1, 1886		Private Co. C, 8th Regt., Dec. 15, 1861; Captain and Engineer, 8th Regt., Aug. 14, 1863; Captain and Paymaster, 3d Brigade, Dec. 22, 1866; Captain and Aide-de-Camp, 3d Brigade, May 16, 1867; discharged Oct. 9, 1869; Aide-de-Camp 3d Brigade, Feb. 7, 1870; Major and Inspector, May 16, 1877; discharged March 26, 1880; Colonel and Assistant Chief of Ordnance, March 8, 1882; Brigadier-General and Chief of Ordnance, Jan. 1, 1886.	N. Y.
Assistant Chief of Ordnance—Colonel.			
William H. Brownell, Jan. 7, 1886		Private, Co. E, 47th Regt., Oct. 12, 1869; Corporal, Nov. 20, 1871; Sergeant, July 24, 1872; Second Lieutenant, May 13, 1873; First Lieutenant, Jan. 20, 1874; Captain, Oct. 10, 1874; Major, Dec. 23, 1874; Lieutenant-Colonel, Dec. 29, 1875; Colonel, Sept. 5, 1877; Brigadier-General, Sept. 5, 1881; resigned Jan. 7, 1886; Colonel and Assistant Chief of Ordnance, Jan. 7, 1886.	N. Y.
Assistant in Ordnance Department—Colonel.			
Joseph G. Story, Jan. 20, 1880	First Sergeant, Co. A, 23d Regt., N. G. S. N. Y., June 18, 1863, to July 22, 1863.	Private, Co. A, 23d Regt., Jan. 20, 1862; Corporal, Jan 27, 1862; Sergeant, Aug. 28, 1862; First Sergeant, Nov. 6, 1863; Second Lieutenant, Sept. 7, 1866; First Lieutenant, March 1, 1867; Captain, Jan. 13, 1875; Colonel and Assistant Inspector-General Rifle Practice, Jan. 20, 1880; Colonel and Assistant in Ordnance Department, Jan. 1, 1883; reappointed Aug. 18, 1887, with original rank, Jan. 20, 1880.	N. Y.

ORDNANCE DEPARTMENT—*(Continued).*

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Ordnance Officers of Brigades—Majors.			
Paul Dana (1). May 7, 1883		Major and Ordnance Officer, 2d Brigade, May 7, 1883; Supernumerary, Aug. 5, 1886; Ordnance Officer, 1st Brigade, Oct. 3, 1886, with original rank.	N. Y.
George Kinkle, Jr. (2), May 17, 1886,		Private, Co. H, 13th Regt., July 26, 1878; Quartermaster-Sergeant, March 26, 1879; Second Lieutenant, June 8, 1880; First Lieutenant, Sept. 3, 1880; resigned Oct. 8, 1880; Major and Ordnance Officer, 4th Brigade, May 17, 1886; Supernumerary, Aug. 5, 1886; Ordnance Officer, 2d Brigade, Nov. 5, 1886, with original rank.	N. Y.
Patrick F. Bulger (3), Sept. 8, 1886			
Fred'k A. Jewett (4), March 15, 1887,		First Lieutenant and Aide-de-Camp, 14th Brigade. Sept. 6, 1881: Captain and Aid-de-Camp, 8th Brigade, April 23, 1883; Supernumerary, Aug. 5, 1886; Aid-de-Camp, 4th Brigade, Sept. 7, 1886, with original rank; Major and Ordnance Officer, March 15, 1887.	N. Y.

CHIEF OF ARTILLERY.

Brigadier-General.			
Daniel D. Wylie, Jan. 18, 1877.....	Private, Co. I, 8th Regt., N. Y. State Militia, April 25, 1861, to Aug. 2, 1861, and May 29, 1862, to Sept. 9, 1862.	Private, Co. I, 8th Regt., June 20, 1859; First Lieutenant and Adjutant, Washington Grays Cavalry, Nov. 4, 1867; Captain, Washington Grays Troop, March 10, 1870; Captain and Inspector of Rifle Practice, 3d Brigade, Nov. 2, 1874; Major and Inspector of Rifle Practice, 3d Brigade, April 30, 1875; Major and Inspector, Sept. 13, 1876; Brigadier-General and Chief of Ordnance, Jan. 18, 1877; re-appointed Jan. 22, 1879; Jan. 2, 1883; Brigadier-General and Chief of Art., Jan. 1, 1886, with rank from Jan. 18, 1877.	N. J.
Assistant Chief of Artillery—Colonel.			
Frank S. Collins, March 29, 1886...	Cadet and Midshipman, Naval Academy, graduated June, 1875; served two years as full Midshipman in United States Navy.	Major and Aide-de-Camp, 1st Division, Oct. 22, 1864; Colonel and Assistant Chief of Artillery, March 29, 1886.	N. Y.

DEPARTMENT OF RIFLE PRACTICE.

General Inspector of Rifle Practice—Brigadier General.			
Charles F. Robbins, Jan. 1, 1883....	With 7th N. G., in U. S. service three months in 1862, thirty days in 1863.	Private, Company C, 7th Regiment, Aug. 1861; Corporal in 1862; Sergeant in 1863; First Sergeant in 1865; Second Lieutenant, Dec. 13, 1867; First Lieutenant, Feb. 17, 1871; Captain and Inspector of Rifle Practice, May 15, 1875; honorably discharged, Nov. 25, 1881; General Inspector of Rifle Practice, Jan. 1, 1883.	N. Y.
Assistant General Inspector of Rifle Practice—Colonel.			
John Bodine, January 1, 1883.....	.....	Private, 96th Militia, 1844; First Lieutenant, 1844; Captain, 1845; Lieutenant-Colonel, 1845; discharged by reorganization of militia, 1847; Captain of Military District, 1847; honorably discharged, 1847; Major and Inspector of Rifle Practice, 8th Brigade, Jan. 19, 1875; Lieutenant-Colonel and Inspector of Rifle Practice, 5th Division, July 12, 1875; Supernumerary, Dec. 17, 1881; Colonel and Assistant General Inspector of Rifle Practice, Jan. 1, 1883.	N. Y.

DEPARTMENT OF RIFLE PRACTICE.—*(Continued).*

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Assistants in Department—Colonel.			
Pascal P. Beals, January 8, 1884		Captain and Aide-de-Camp, 8th Division, Oct. 9, 1879; Major and Inspector of Rifle Practice, 14th Brigade, October 10, 1879; Lieutenant-Colonel and Inspector of Rifle Practice, 8th Division, May 3, 1881; Colonel and Assistant in Department of Rifle Practice, Jan. 8, 1884.	N. Y.
Inspectors of Rifle Practice of Brigades—Majors.			
Alan H. G. Hardwicke (4), June 3, 1884.		Private, Co. G, 23d Regt., Oct. 6, 1876; dropped Aug. 6, 1877; Major and Aide-de-Camp, 4th Division, June 3, 1884; Major and Ordnance Officer, 8th Brigade, June 3, 1886; Supernumerary, Aug. 5, 1886; Ordnance Officer, 4th Brigade, Sept. 7, 1886, with original rank; Inspector of Rifle Practice, April 6, 1887, with original rank.	Eng.
George L. Fox (2), January 19, 1885.		Private, 23d Regt., July 3, 1878; Corporal, Feb. 4, 1880; Second Lieutenant, Co. F, June 13, 1882; Inspector, Dec. 8, 1884; Major and Inspector of Rifle Practice, 4th Brigade, Jan. 19, 1885; Supernumerary, Aug. 5, 1886; Inspector Rifle Practice, 2d Brigade, Oct. 5, 1886, with original rank.	N. Y.
Charles H. Gaus (3), September 10, 1886.	Private, 91st N. Y. vols., Aug. 31, 1864; discharged May 10, 1865.	Private, Co. H, 10th Regt., Oct. 30, 1880; discharged by disbandment, March 7, 1881; Private, Co. D, 10th Battalion, May 29, 1882; discharged March 1, 1883; Private, Co. D, 10th Battalion, June 1, 1883; First Lieutenant and Inspector of Rifle Practice, Oct. 23, 1883; Major and Inspector Rifle Practice, 3d Brigade, Sept. 10, 1886.	Ohio.
Clarence H. Eagle (1), November 30, 1886.		Private, Co. B, 7th Regt., Dec. 6, 1875; Corporal, April 7, 1879; Captain, Co. E, 12th Regt., Dec. 28, 1883; resigned Nov. 29, 1886; Major and Inspector Rifle Practice, 1st Brigade, Nov. 30, 1886.	N. Y.

To the Commander-in-Chief—Colonels.		
John V. L. Pruyn, Jan. 1, 1886	Colonel and Aide-de-Camp, Jan. 1, 1886	N. Y.
Hugh O'Donoghue, Jan. 1, 1886	Colonel and Aide-de-Camp, Jan. 1, 1886	N. Y.
Albert B. Hilton, Jan. 1, 1886	Colonel and Aide-de-Camp, Jan. 1, 1886	N. Y.
Edmund L. Judson (2), Jan. 1, 1886	Private, Co. A, 10th Battalion, May 18, 1885; Corporal, Oct. 5, 1885; Colonel and Aide-de-Camp, Jan. 1, 1886.	N. Y.
Charles E. Walker, Jan. 1, 1886	Colonel and Aide-de-Camp, Jan. 1, 1886	N. Y.
John F. Gaynor, Jan. 1, 1886	Major and Assistant in Inspector-General's Department, March 27, 1885; Colonel and Aide-de-Camp, Jan. 1, 1886.	N. Y.
Aides-de-Camp to Brigade Commanders — Captains.		
W. Emlen Roosevelt (1), April 23, 1883	Captain and Assistant Quartermaster, 2d Brigade, April 21, 1882; Captain and Aide-de-Camp, April 23, 1883; Supernumerary, Aug. 5, 1886; Aide-de-Camp, 1st Brigade, Sept. 7, 1886, with original rank.	N. Y.
Francis Root Keating (4), Feb. 9, 1886	Private, Co. F, 74th Regt., Sept. 5, 1884; on duty with Signal Corps from Oct. 21, 1884; Corporal, Jan. 25, 1885; Captain and Aide-de-Camp, 8th Brigade, Feb. 9, 1886; Supernumerary, Aug. 5, 1886; Aide-de-Camp, 4th Brigade, Sept. 7, 1886, with original rank.	N. Y.
Francis D. Beard (2), May 24, 1886	Captain and Aide-de-Camp, 4th Brigade, May 24, 1886; Supernumerary, Aug. 5, 1886; appointed Aide-de-Camp, 2d Brigade, with original rank, Dec. 24, 1886.	N. Y.
Francis R. Appleton (1), Aug. 30, 1886	Captain and Aide-de-Camp, 2d Brigade, May 26, 1882; Major and Inspector of Rifle Practice, April 23, 1883; Supernumerary, Aug. 5, 1886; Aide-de-Camp, 1st Brigade, Aug. 30, 1886.	N. Y.
Charles J. Peabody (3), Sept. 8, 1886	Private, Co. A, 23d Regt. April 2, 1878; dropped, Feb. 9, 1880; Private, Co. A, 10th Regt., Oct. 5, 1880; Corporal, Oct. 22, 1881; Sergeant, Jan. 9, 1883; discharged, Dec. 18, 1883; Captain and Aide-de-Camp, 3d Brigade, Sept. 8, 1886.	Ga.

AIDES-DE-CAMP — *(Continued).*

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Hobart Warren Thompson (3), Sept. 8, 1886		Private, 6th Separate Co., Jan. 17, 1884; Captain and Aide-de-Camp, 3d Brigade, Sept. 8, 1886.	N. Y.
Chas. R. Wilson (4), March 15,1887		Private, Signal Corps, 8th Brigade, Feb. 4, 1886; disbanded Aug. 5, 1886; Captain and Aide-de-Camp, 4th Brigade, March 15, 1887.	Mass

ARTILLERY.

FIRST BATTERY.

Armory at 334–340 West Forty-fourth street, New York city.

(Attached to the First Brigade.)

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Captain.			
Louis Wendel, Dec. 15, 1882		First Lieutenant, Battery K (now 1st Battery), Sept. 27, 1881; Captain, Dec. 15, 1882.	Ger.
First Lieutenant.			
John T. Griffith, June 21, 1887		Private, 1st Battery, April 25, 1883; Veterinary Sergeant, July 1, 1883; Second Lieutenant, March 25, 1884; First Lieutenant, June 21, 1887.	N. Y.
Charles Nagel, Nov. 15, 1887		Private, Co. D, 11th Regt., July 4, 1866; Sergeant, Sept. 18, 1871; Second Lieutenant, June 1, 1872; honorably discharged, May 28, 1874, Private, 1st Battery, Jan. 26, 1883; Second Lieutenant, April 5, 1883; First Lieutenant, Nov. 15, 1887.	Ger.
First Lieutenant and Assistant Surgeon.			
Eugene Zachary Brievogelle, Aug. 12, 1886		First Lieutenant and Assistant Surgeon, 1st Battery, Aug. 12, 1886.	Pa.

SECOND BATTERY.

Armory, Broadway, corner of West Forty-fifth street, New York City.

(Attached to the First Brigade.)

Captain.			
Ferdinand P. Earle, April 5, 1881		Private, Co. B, 7th Regt., Oct. 23, 1862; honorably discharged, Oct. 29, 1869; Captain, 2d Battery, April 5, 1881.	Conn.

ARTILLERY — SECOND BATTERY — *(Continued).*

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
First Lieutenant.			
David Wilson, Nov. 28, 1884		Private, 2d Battery, Sept. 1, 1869; Corporal, Jan. 2, 1870; Sergeant, June 12, 1871; Quartermaster Sergeant, Nov. 9, 1874; First Sergeant, April 21, 1875; Second Lieutenant, May 17, 1883; First Lieutenant, Nov. 28, 1884.	Ire.
Second Lieutenants.			
George E. Pasco, Jan. 27, 1885		Private, 2d Battery, Oct. 26, 1875; Quartermaster Sergeant, March 10, 1879; Second Lieutenant, Jan. 27, 1885.	N. Y.
Oscar L. Rogers, Sept. 29, 1887		Private, 2d Battery, May 5, 1887; Second Lieutenant, Sept. 29, 1887.	La.
First Lieutenant and Assistant Surgeon.			
Michael T. Carroll, Sept. 30, 1887		Assistant Surgeon, 2d Battery, Sept. 30, 1887	N. Y.

THIRD BATTERY.

Armory 759–765 Dean street, Brooklyn.

(Attached to the Second Brigade.)

Captain.			
Henry Sebastian Rasquin, May 22, 1882		Private, Gatling Gun Battery, 11th Brigade, April 13, 1877; Sergeant, Sept. 29, 1879; First Lieutenant, June 20, 1881; Captain, May 22, 1882.	Ger.
First Lieutenant.			
William Waldron Hanold, Sept. 2, 1882	In U. S. navy from 1865 to 1871	Private, Gatling Battery, Nov. 15, 1875; Corporal, Feb. 17, 1876; Sergeant, March 4, 1878; Second Lieutenant, Co. D, 13th Regt., Dec. 10, 1879; First Lieutenant, Nov. 30, 1880; First Lieutenant, 3d Battery, Sept. 2, 1882.	N. Y.

Second Lieutenants.			
Samuel Duncan Bell, July 1, 1884.	.....	Private, Co. C, 22d Regt., March 21, 1877; Corporal, May 19, 1881; Sergeant, July 5, 1882; honorably discharged Dec. 14, 1883; Private, 3d Battery, Dec. 31, 1883; Second Lieutenant, July 1, 1884.	Ire.
Walter F. Barnes, Sept 26, 1887.	.....	Private, 47th Regt., Oct, 2, 1879; honorably discharged May 25, 1887; Second Lieutenant, 3d Battery, Sept. 26, 1887.	N. J.
First Lieutenant and Assistant-Surgeon.			
Crawford D. Beasley, Jan. 3, 1887.	.....	Private, Co. A, 23d Regt., June 2, 1886; First Lieut. and Assistant Surgeon, 3d Bat., Jan. 3, 1887.	N. Y.

FIFTH BATTERY.

Armory at Syracuse.

(Attached to the Fourth Brigade.)

Captain.			
Michael Auer (Cavalry), April 6, 1870, with rank as Captain in Artillery, September 2, 1881; Brevet-Major, February 29, 1876.	Private, Co. B, 12th N. Y. vols., May 13, 1861; First Sergeant, May 13, 1861; Second Lieutenant, Feb. 22, 1862; First Lieutenant, Oct. 27, 1862; honorably discharged May 17, 1863; Captain, 15th N. Y. vols., Cavalry, July 24, 1863; Major, Aug. 30, 1864; honorably discharged March 6, 1865.	Private, Co. H, 51st Regt., 1856; Private, Washington Artillery; Private Co. D, 51st Regt.; Private, Co. E, 51st Regt.; Captain, Troop C, 2d Battalion of Cavalry, April 6, 1870; transferred to Artillery, Sept. 2, 1881.	Swit.
First Lieutenants.			
Edwin J. Luff, January 31, 1882.	Private 26th N. Y. vols., Battery, Oct. 4, 1862; Corporal and Sergeant; honorably discharged Sept. 12, 1865.	Private, 5th Battery, N. G., S. N. Y., Oct, 17, 1881; First Lieutenant, Jan. 31, 1882.	Eng.
Almeron D. Hayes, May 29, 1883.	Private, Co. H, 157th N. Y. vols., Aug. 18, 1862; Corporal; honorably discharged Aug. 2, 1865.	First Lieutenant, May 29, 1883.	N. Y.
Second Lieutenants.			
William H. Gadow, June 20, 1883.	.....	Private, Dec. 4, 1877, Separate Troop C, 6th Division; Corporal, February 9, 1881; Sergeant, 5th Battery, April 11, 1882; First Sergeant, Dec. 16, 1882; Second Lieutenant, June 20, 1883.	Ger.

ARTILLERY — FIFTH BATTERY — *(Continued).*

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Second Lieutenant.			
John N. Bates, March 25, 1885.	.....	Private, 5th Battery, March 19, 1879; Quartermaster-Sergeant, Aug. 29, 1882; First Sergeant, July 24, 1883; Second Lieutenant, March 25, 1885.	N. Y.
Attached to Battery, Supernumerary Officer as Assistant Surgeon — Major and Surgeon.			
Gregory Doyle, June 1, 1872.....	.....	Surgeon, 51st Regt., June 1, 1872; rendered Supernumerary, Dec. 17, 1881; assigned to duty with Battery, May 10, 1883.	Ire.

SIXTH BATTERY.

Armory on Dickinson street, Binghamton.

(Attached to the Third Brigade.)

Captain.			
Laurel L. Olmsted, Nov. 13, 1874..	Third Assistant Engineer, United States Navy, Nov. 24, 1860; discharged July, 1863.	Private, 6th Battery, March 20, 1870; First Lieutenant, March 30, 1870; Captain, Nov. 13, 1874.	N. Y.
First Lieutenant.			
John N. Underwood, Aug. 22, 1881,	Private, Co. G, 2d N. Y. vol. Art., Aug. 4, 1862; Sergeant; honorably discharged May, 1865.	Private, 6th Battery, Jan. 1, 1872; Sergeant, July 5, 1875; First Sergeant, Sept. 27, 1877; Second Lieutenant, Aug. 15, 1878; First Lieutenant, Aug. 22, 1881.	Conn
Second Lieutenant.			
John H. Gross, June 10, 1881	Private, 6th N. Y. vol. Cavalry, Nov. 5, 1861; Corporal; discharged Aug. 9, 1865.	Private, 6th Battery, March 19, 1880; Sergeant June 7, 1881; Second Lieutenant, June 10, 1881.	N. Y.

INFANTRY.

SEVENTH REGIMENT — (Ten Companies).

First Brigade.

Armory, Fourth avenue and Sixty-seventh street, New York city.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Colonel.				
Emmons Clark, June 21, 1864	....	Captain, Co. B, 7th Regt., N. Y. S. militia, from April 19 to June 3, 1861; from May 26 to Sept. 5, 1862; from June 17 to July 21, 1863.	Private, Co. B, 7th Regt., Jan. 22, 1857; First Sergeant, April 5, 1858; Second Lieutenant, Sept. 20, 1859; First Lieutenant, June 14, 1860; Captain, Dec. 26, 1860; Colonel, 7th Regt., June 21, 1864.	N. Y.
Lieutenant-Colonel.				
George Moore Smith, March 5, 1881	....	Private, Co. B, 7th Regt., N. Y. S. militia, from May 2 to June 3, 1861; as First Sergt. and Second Lieut., from May 26 to Sept. 5, 1862; as Second Lieut. from June 17 to July 21, 1863.	Private, Co. B, 7th Regt., April 20, 1861; First Sergeant, Sept. 13, 1861; Second Lieutenant, June 5, 1862; First Lieutenant, June 30, 1864; Captain, Co. G, Dec. 31, 1864; Major, 7th Regt., April 8, 1870; Lieutenant-Colonel, March 5, 1881.	Me.
Major.				
William H. Kipp, May 10, 1886	....	As Private, Co. D, 7th Regt., N. Y. S. militia. April 19 to June 3, 1861; Corporal and Sergeant, from May 26 to Sept. 5, 1862; and Second Lieut., from June 17 to July 21, 1863.	Private, Co. D, 7th Regt., Oct. 21, 1857; Corporal, May 29, 1862; Sergeant, July 4, 1862; Second Lieutenant, Oct. 16, 1862; First Lieutenant, Dec. 30, 1863; Adjutant, 7th Regt., June 30, 1866; Captain, Co. D, 7th Regt., Oct. 8, 1866; Major, May 10, 1886.	N. Y.
Adjutant — First Lieutenant.				
George W. Rand, Nov. 16, 1882	....	.....	Private, Co. F, 7th Regt., Nov. 30, 1869; Corporal, Nov. 14, 1871; Sergeant, Oct. 4, 1872; First Sergeant, Nov. 7, 1873; Second Lieutenant, Sept. 4, 1874; First Lieutenant, May 23, 1876; Adjutant, Nov. 16, 1882.	N. H.

INFANTRY — SEVENTH REGIMENT — *(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Quartermaster — First Lieutenant.				
John F. Long, June 2, 1884	....	.....	Private, Co. F, 7th Regt., Oct. 13, 1868; Left General Guide, Dec. 5, 1881; Regimental Quartermaster Sergeant, Nov. 17, 1882; Quartermaster, June 2, 1884.	N. Y.
Commissary of Subsistence — First Lieutenant.				
Walter G. Schuyler, July 31, 1885	....	.....	Private, Co. B, 7th Regt., Sept. 4, 1871; Corporal, April 3, 1876; Company Quartermaster Sergeant, Oct. 7, 1878; Commissary of Subsistence, July 31, 1885.	N. Y.
Surgeon — Major.				
Daniel M. Stimson, April 23, 1883	....	.....	Major and Surgeon, 10th Regt., N. G. S. N. Y., Oct. 1, 1868; honorably discharged, July 26, 1871; Captain and Surgeon, 7th Regt., Nov. 15, 1878; Major and Surgeon, April 23, 1883.	N. Y.
Assistant Surgeon — Captain.				
William A. Valentine, June 1, 1887	....	.....	Private, Co. F, 7th Regt., June 3, 1880; Captain and Ass't Surgeon, 7th Regt., June 1, 1887.	
Chaplain — Captain.				
John R. Paxton, Nov. 16, 1887	....	Private, Co. G, 140th Pa. vols., Aug. 14, 1862; Sergeant, May 15, 1863, First Sergeant, July 4, 1863; Second Lieut., Dec. 10, 1864; First Lieut., April 20, 1865; Captain, May 16, 1865; mustered out, May 31, 1865.	Chaplain, 7th Regt., Nov. 16, 1887	Pa.
Inspector of Rifle Practice — Captain.				
William H. Palmer, May 1, 1883	....	Acting Assistant Paymaster, U. S. Navy, Oct. 15, 1864; honorably discharged, Oct. 15, 1865.	Private, Co. F, 7th Regt., Nov. 9, 1875; Quartermaster Sergeant, 7th Regt., Jan. 5, 1879; Second Lieutenant, Feb. 3, 1879; First Lieutenant, Dec. 15, 1882; Captain and Inspector of Rifle Practice, May 1, 1883.	Mass.

Captains.				
Don Alonzo Pollard, April 5, 1866	C	As Private, Co. C, 7th Regt., N. Y. S. militia, from April 19 to June 3, 1861; First Sergeant, same company, from May 26 to Sept. 5, 1862; and June 17 to July 21, 1863.	Private, Co. C, 7th Regt., May 2, 1860; Corporal, Aug. 7, 1861; First Sergeant, Dec. 28, 1861: Second Lieutenant, Dec. 30, 1863; First Lieutenant, Aug. 29, 1864; Captain, April 5, 1866.	N. Y.
James C. Abrams, Sept. 29, 1875	G	As Private in Co. H, 7th Regt., N. Y. S. militia, from April 19, to June 3, 1861; and from June 17 to July 21, 1863.	Private, Co. H, 7th Regt., Oct. 8, 1860; Corporal, Jan. 9, 1865; Sergeant, October 9, 1865; First Sergeant, April 8, 1867; Second Lieutenant, Aug. 10, 1868; First Lieutenant, Jan. 9, 1873; Captain, Co. G, Sept. 29, 1875.	N. Y.
Henry S. Steele, June 3, 1878	B	Private, Co. B, 7th Regt., N. Y. S. militia, mustered in May 26, and mustered out Sept. 5, 1862; Corporal, Co. B, June 17 to July 21, 1863.	Private, Co. B, 7th Regt., May 26, 1862; Corporal, June 20, 1863; Sergeant, Oct. 1, 1866; Adjutant, 7th Regt., Nov. 10, 1866; Second Lieutenant, Co. B, 7th Regt., Feb. 25, 1867: First Lieutenant, Oct. 3, 1867; honorably discharged, Oct. 1, 1869; Private, Co. B, 7th Regt., Oct. 1, 1869; Sergeant, Nov. 1, 1870; First Sergeant, April 23, 1873; Second Lieutenant, Nov. 4, 1873; First Lieutenant, May 3, 1875; Captain, June 3, 1878.	N. Y.
Daniel Appleton, Jan. 13, 1879	F	.....	Private, Co. F, 7th Regt., Oct. 31, 1871; Corporal, April 8, 1873; Sergeant, Nov. 7, 1873; First Sergeant, March 9, 1875; Second Lieutenant, May 23, 1876; Captain, Jan. 13, 1879.	N. Y.
George B. Rhoads, Oct. 25, 1880	E	....	Private Co. E, 7th Regt., Sept. 7, 1866; Corporal, Jan. 19, 1869; Sergeant, July 7, 1871; First Sergeant, Oct. 5, 1877; Second Lieutenant, May 20, 1879; Captain, Oct. 25, 1880.	N. Y.
Augustus W. Conover, March 31, 1882,	A	.....	Private, Co. B, 7th Regt., March 3, 1870; Corporal, Dec. 19, 1872; Sergeant, May 3, 1875; First Lieutenant, June 3, 1878; Adjutant, 7th Regt., May 24, 1881; Captain, Co. A, March 31, 1882.	N. Y.
Andrew Mills, Oct. 20, 1884	H	.....	Private, Co. H, 7th Regt., June 12, 1871; Corporal, April 9, 1877; Sergeant, March 10, 1879; Second Lieutenant, Feb. 9, 1880; Captain, Oct. 20, 1884.	N. Y.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Louis E. Lefferts, Dec. 3, 1884	K		Private, Co. K, 7th Regt., Oct. 6, 1875; Corporal, Oct. 11, 1878; First Sergeant, Jan. 19, 1881; Second Lieutenant, Dec. 8, 1882; Captain, Dec. 3, 1884.	N. Y.
Harry Dodge Cooper, May 21, 1886	D		Private, Co. D, 7th Regt., Dec. 13, 1875; Corporal, Dec. 6, 1879; Sergeant, April 4, 1881; First Sergeant, May 15, 1883: First Lieutenant, Oct. 13, 1884; Captain, May 21, 1886.	N. J.
James Thorn Harper, Jan. 13, 1887	I		Private, Co. I, 7th Regt., Nov, 6, 1876; Corporal, April 7, 1879; Sergeant, Nov. 9, 1880; Second Lieutenant, Feb. 7, 1882; First Lieutenant, Jan. 10, 1884; Captain, Jan. 13, 1887.	N. Y.
First Lieutenants.				
John A. Tackaberry, Feb. 9, 1880	H		Private, Co. H, 7th Regt., Nov. 9, 1863; Corporal, Aug. 10, 1868; Sergeant, Aug. 14, 1871; Second Lieutenant, Sept. 29, 1876; First Lieutenant, Feb. 9, 1880.	N. Y.
John W. McDougall, May 17, 1882	C		Private, Co. I, 71st Regt., Feb. 8, 1865; discharged Feb. 19, 1872; Private, Co. C, 7th Regt., April 5, 1872; Corporal, Oct. 4, 1872; Sergeant, Jan. 2, 1874; First Sergeant, Feb. 14, 1877; First Lieutenant, May 17, 1882.	N. Y.
Willard C. Fisk, May 29, 1882	A		Private, Co. G, 7th Regt., Mar. 24, 1874; transferred to Co. A, Nov. 25, 1876; Sergeant, Mar. 31, 1879; Second Lieutenant, Apr. 13, 1881; First Lieutenant, May 29, 1882.	N. Y.
J. Egmont Schermerhorn, Dec. 8, 1882,	K		Private, Co. K, 7th Regt., Nov. 26, 1873; Corporal, Apr. 7, 1875; Sergeant, March 22, 1876; First Sergeant, Jan. 28, 1880; Second Lieutenant, Jan. 19, 1881; discharged April, 20, 1882; Second Lieutenant, May 4, 1882; First Lieutenant, Dec. 8, 1882.	N. Y.

Frank Pawling, June 7, 1883	F		Private, Co. F, 7th Regt., Oct. 31, 1871; Corporal, June 6, 1876; Sergeant, Nov. 24, 1876; First Sergeant, Nov. 7, 1879; Second Lieutenant, Dec. 15, 1882; First Lieutenant, June 7, 1883.	N. Y.
Walter S. Wilson, Jan. 8, 1886	E	Private, Co. A, 21st N. Y. National Guard, 30 days in June and July, 1863.	Private, Co. B. 7th Regt., Mar. 5, 1868; Corporal, June 3, 1872; Sergeant, Jan. 7, 1878; First Lieutenant, Co. E, Jan. 8, 1886.	N. Y.
Austin E. Allen, June 14, 1886	D		Private, Co. D, 7th Regt., Oct. 25, 1881; Corporal, Apr. 6, 1883; Sergeant, Sept. 28, 1883; Second Lieutenant, March 27, 1885; First Lieutenant, June 14, 1886.	N. J.
Daniel A. Nesbitt, Nov. 18, 1886	B		Private, Co. B, 7th Regt., Nov. 4, 1867; Sergeant, Feb. 5, 1877; First Sergeant, Apr. 2, 1883; First Lieutenant, Nov. 18, 1886.	N. Y.
Horace C. Du Val, Feb. 10, 1887	I		Private, Co. I, 7th Regt., Oct. 27, 1870; Corporal, Feb. 6, 1872; Sergeant, Jan. 2, 1883; First Sergeant, Jan. 4, 1887; First Lieutenant, Feb. 10, 1887.	N. Y.
James B. Dewson, May 7, 1887	G		Private, Co. G, 7th Regt., Apr. 8, 1870; Corporal, Sept. 22, 1871; Second Lieutenant, Oct. 15, 1872; First Lieutenant, May 7, 1887.	Mass.
Second Lieutenants.				
Charles E. Lydecker, Oct. 24, 1884	H		Private, Co. H, 7th Regt., April 3, 1874; Corporal, Feb. 14, 1881; First Sergeant, Sept. 11, 1882: Second Lieutenant, Oct. 24, 1884.	N. Y.
Eugene T. Kirtland, Dec. 3, 1884	K		Private, Co. K, 7th Regt., Nov. 7, 1879; Corporal, Jan. 26, 1881; Sergeant, Oct. 26, 1881; First Sergeant, Dec. 20, 1882; Second Lieutenant, Dec. 3, 1884.	N. Y.
Wilbur B. Bradley, Jan. 8, 1886	E		Private, Co. E, 7th Regt., Oct. 10, 1882; Corporal, June 6, 1884; Sergeant, May 15, 1885; Second Lieutenant, Jan. 8, 1886.	Conn
James J. McKenna, June 28, 1886	A		Private, Co. A, 7th Regt., March 27, 1874; Corporal, June 26, 1876; discharged July 2, 1881; reënlisted Oct. 6, 1882; Corporal, Oct. 30, 1882; First Sergeant, Feb. 16, 1883; Second Lieutenant, June 28, 1886.	N. Y.

INFANTRY — SEVENTH REGIMENT — *(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Second Lieutenants.				
Franklin Bouker, July 30, 1886	D		Private, 4th Regt., N. G. N. J., Sept. 6, 1871; discharged Feb. 13, 1877; Private, Co. D, 7th Regt., Oct. 1, 1880: Corporal, April 10, 1883; Sergeant, June 22, 1883; Second Lieutenant, July 30, 1886.	N. J.
George H. Gould, March 1, 1887	I		Private, Co. I, 7th Regt., Nov. 6, 1876; Corporal, Feb. 7, 1882; Sergeant, Feb. 5, 1884; Second Lieutenant, March 1, 1887.	N. Y.
Wallace F. Peck, April 26, 1887	F		Private, Co. F, 7th Regt., Oct. 19, 1880: Sergeant, Dec. 15, 1882; Second Lieutenant, April 26, 1887.	N. Y.
John McGreevey, May 25, 1887	G		Private, Co. G, 7th Regt., Nov. 13, 1868; Corporal, April 8, 1870; Sergeant, June 21, 1872; First Sergeant, May 25, 1874; discharged Jan. 19, 1881; reënlisted March 28, 1881; First Sergeant, April 8, 1881; honorably discharged May 12, 1882; Second Lieutenant, Co. G, May 25, 1887.	N. Y.
Stephen W. Merritt, May 26, 1887	B		Private, Co. B, 7th Regt., July 1, 1880: Corporal, April 10, 1883; Sergeant, Oct. 17, 1884; Second Lieutenant, May 26, 1887.	N. Y.

EIGHTH REGIMENT — (Eight Companies).

First Brigade.

Armory located at 281 *Ninth avenue, New York city.*

Colonel.				
George D. Scott, Oct. 8, 1869	....	As Sergeant, Co. F, 8th N. Y. S. militia, April 25 to Aug. 2, 1861; as Second and First Lieutenant, May 29 to Sept. 9, 1862; as First Lieutenant, June 29, 1863, to July 23, 1863.	Private, Co. F, 8th Regt., July 27, 1856; Corporal, 1860; Sergeant, Jan. 10, 1862; First Sergeant, Feb. 27, 1862; First Lieutenant, Sept. 24, 1862; Captain, Dec. 30, 1864; Lieutenant-Colonel, 8th Regt., Dec. 27, 1866; Colonel, Oct. 18, 1869.	N. Y.
Lieutenant-Colonel.				
Francis A. Schilling, Dec. 14, 1870; Brevet-Colonel, Dec. 16, 1879	....	First Lieutenant, 55th N. Y. vols., rank from Aug. 29, 1861; honorably discharged Dec. 23, 1862.	Private, 20th Regt., militia, Oct., 1851; left district in July, 1853; Private, 55th Regt., militia, May 27, 1859; Corporal, March 1, 1860; Sergeant, Feb., 1861; First Lieutenant, 55th N. Y. S. militia, Aug. 29, 1861; vacated office by entry in volunteer service, Jan. 26, 1862; First Lieutenant, 55th N. G. S. N. Y., June 21, 1863; Captain, Sept. 2, 1864; Major, July 7, 1869; Lieutenant-Colonel, Dec. 14, 1870; Supernumerary, Dec. 18, 1875; on active duty as Lieutenant-Colonel, 8th Regt., Dec. 16, 1879.	Fr.
Major.				
Henry Chauncey, Jr., Sept. 6, 1886	....	.....	First Lieutenant, Co. G, 8th Regt., March 1, 1883; Captain, Co. H, July 12, 1883; Major, Sept. 6, 1886.	R. I.
Adjutant—First Lieutenant.				
James O. Johnston, April 6, 1874	....	As Captain, 8th N. Y. S. militia, from April 25 to Aug. 2, 1861, and from May 29 to Sept. 9, 1862.	Private, Co. A, 8th Regt., Oct. 27, 1854; Corporal, Jan. 2, 1857; Sergeant, March 6, 1857; Second Lieutenant, May 21, 1858; First Lieutenant, Oct. 11, 1858; Captain, Feb. 6, 1861; transferred to 9th Regt. Dec. 16, 1864; discharged March 12, 1867; Adjutant, 8th Regt., April 6, 1874.	Me.
Quartermaster—First Lieutenant.				
George L. Wentworth May 11, 1880	....	.....	Private, Co. A, 8th Regt., Oct. 20, 1865; Sergeant in 1866; Hospital Steward, 8th Regt., Dec. 4, 1869; Quartermaster-Sergeant, April 8, 1870; Sergeant-Major, May 9, 1873; Quartermaster and First Lieutenant, May 11, 1880.	N. Y.

INFANTRY — EIGHTH REGIMENT — *(Continued).*

NAME GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Commissary of Subsistence—First Lieutenant.				
Philip Milligan, Jan. 20, 1881	....	.....	Private, 8th Regt., March 13, 1871; Commissary of Subsistence, Jan. 20, 1881.	Ire.
Surgeon—Major.				
Charles E. Bruce, April 23, 1883	....	.....	Assistant Surgeon and First Lieutenant, April 28, 1879; Captain and Surgeon, Aug. 15, 1881; Major and Surgeon, April 23, 1883.	N. Y.
Assistant Surgeon — Captain.				
Samuel Hemmingway, May 21, 1884	....	.....	First Lieutenant and Assistant Surgeon, Aug. 15, 1881; Captain and Assistant Surgeon, May 21, 1884.	N. J.
Chaplain — Captain.				
Wesley R. Davis, April 23, 1879	....	.....	Chaplain, 8th Regt., April 23, 1879.	Md.
Inspector of Rifle Practice - Captain.				
Edward Barker, May 3, 1875; Brevet Major, Dec. 16, 1879	....	As Sergeant, Co. F, 8th Regt., from April 25 to Aug. 2, 1861; as First Sergeant, from June 29 to July 23, 1863.	Private, Co. F, 8th Regt., Dec. 28, 1857; Sergeant, Jan. 10, 1862; First Sergeant, Dec. 30, 1862; First Lieutenant, Jan. 21, 1867; Captain, Oct. 11, 1869; discharged April 7, 1874; Captain and Inspector of Rifle Practice, May 3, 1875.	Eng.
Captains.				
Andrew A. Oates, April 13, 1885	G	.....	Private, Co. G, 8th Regt., Nov. 11, 1874; Sergeant, Aug. 7, 1878; First Sergeant, July 14, 1880; First Lieutenant, Nov. 19, 1883; Captain, April 13, 1885.	.....
E. Austin Oothout, May 5, 1885	E	.....	Second Lieutenant, Co. H, 8th Regt., Oct. 27, 1884; Captain, Co. E, May 5, 1885.	.....
William H. Dewar, Feb. 3, 1886	I	.....	Private, Co. H, 8th Regt., May 8, 1876; Sergeant, March 31, 1884; First Lieutenant, Oct. 27, 1884; Captain, Co. I, Feb. 3, 1886.	N. Y.

Thomas M. Young, March 15, 1886	B		Private, Co. B, 8th Regt., Jan. 21, 1875; Corporal, May 4, 1876; Sergeant, May 6, 1880; First Sergeant, June 26, 1882; Second Lieutenant, Feb. 16, 1883; First Lieutenant, Dec. 6, 1883; Captain, March 15, 1886.	Penn
Alexander T. Mason, Nov. 11, 1886	C		Second Lieutenant, Co. H, 8th Regt., May 30, 1886; Captain, Co. C, Nov. 11, 1886.	R. I.
Haughwout Howe, March 5, 1887	D		First Lieutenant, Co. D, 8th Regt., Nov. 30, 1886; Captain, March 5, 1887.	N. Y.
W. De Lancey Cunningham, Nov. 16, 1887	H		Second Lieutenant, Co. I, 8th Regt., May 14, 1886; First Lieutenant, Nov. 17, 1886; Captain, Co. H, Nov. 16, 1887.	N. Y.
First Lieutenants.				
George B. McClellan, Dec. 1, 1885	E		First Lieutenant, Co. E, 8th Regt., Dec. 1, 1885,	Ger.
Henry L. Cammann, Nov. 11, 1886	C		First Lieutenant, Co. C, 8th Regt., Nov. 11, 1886,	Ire.
Geo. C. Heilner, June 20, 1887	D		Second Lieutenant, Co. D, 8th Regt., Feb. 5, 1887; First Lieutenant, June 20, 1887.	Pa.
Second Lieutenants.				
Knight Neftel, Oct. 26, 1886	E		Second Lieutenant, Co. E, 8th Regt., Oct. 26, 1886.	Eng.
Ike Freeman, Nov. 11, 1886	C		In 4th Regt., Texas N. G., 1883; Second Lieutenant, Co. C., 8th Regt., Nov. 11, 1886.	N. Y.
George P. Camman, March 5, 1887	I			

NINTH REGIMENT — (Ten Companies).

First Brigade.

Armory located at 221 *West Twenty-Sixth street, New York city.*

Colonel.				
William Seward, Jr., April 17, 1882		Corporal, Co. E, 7th Regt., N. G. S. N. Y., service in 1861, from April 19 to June 3; Sergeant, and First Lieutenant in 1862, from May 25, to Sept. 5; and in 1863, First Lieutenant, from June 16 to July 20.	Private, Co. E, 7th Regt., Oct. 1, 1858; Corporal; Sergeant; First Lieutenant, June 3, 1862; honorably discharged Oct. 1, 1863; Adjutant, 9th Regt., Sept. 22, 1866; Major, June 8, 1868; Lieutenant-Colonel and Assistant Adjutant-General, 3d Brigade, April 1, 1870; Colonel, 9th Regt., April 17, 1882.	N. Y.

INFANTRY — NINTH REGIMENT — *(Continued).*

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Lieutenant-Colonel.				
Thomas B. Rand, Feb. 5, 1884		Captain, Co. C, 33d Mass. vols., July 21, 1862; honorably discharged June 29, 1865.	Sergeant, Co. B, 2d Battalion, Mass. Vol. Militia (Boston Light Infantry), April 10, 1859; discharged Sept., 1860; Major, 9th Regt., N. G. S. N. Y., June 1, 1882; Lieutenant-Colonel, Feb. 5, 1884.	N. H.
Major.				
Clifford A. H. Bartlett, Feb. 5, 1884			Private, Co. C, 7th Regt., Oct. 4, 1871; Corporal; Colonel and Aid-de-Camp on staff of Commander-in-Chief, Jan. 1, 1875; commission expired Dec. 31, 1879; Adjutant, 9th Regt,, June 25, 1883; Major, Feb. 5, 1884.	Mass
Adjutant — First Lieutenant.				
Yellott D. Dechert, April 28, 1884			Private, Co. I, 7th Regt., May 8, 1883; Adjutant 9th Regt., April 28, 1884.	N. Y.
Quartermaster — First Lieutenant.				
Dana B. Pratt, Nov. 19, 1886			Private, Co. K, 9th Regt., Feb. 5, 1883; Sergeant, Sept. 15, 1884; Left General Guide, May 8, 1885; Quartermaster-Sergeant, 9th Regt., Dec. 18, 1885; First Lieutenant and Quartermaster, Nov. 19, 1886.	Mass
Commissary of Subsistence — First Lieutenant.				
W. Romeyn Vermilye, June 7, 1882		With 7th Regt., N. G. S. N. Y., service in 1861, from April 19 to June 3; in 1862, from May 25 to Sept. 5; and in 1863, from June 16 to July 20.	Private 5th Co., 7th Regt., fall of 1858; dropped as Sergeant in 1864; in Co. B, 2d Battalion, N. G. S. N. J., in 1869, from Private to Captain; Judge-Advocate of the Battalion and resigned in 1878, and taken up in Co. H., 7th Regt.; First Lieutenant and Aide-de-Camp, 3d Brigade, Dec. 27, 1881; Captain and Commissary Subsistence, Dec. 27, 1881; commission expired and appointed Commissary Subsistence, 9th Regt., June 7, 1882.	N. Y.

Surgeon — Major.				
Stephen W. Roof, Nov. 27, 1876	....	Wardmaster on board of hospital transport Daniel Webster, from May to August, 1862.	Major and Surgeon of Regt., Nov. 27, 1876	N. Y.
Assistant Surgeon — Captain.				
Alvah H. Doty, May 21, 1884	....	.....	First Lieutenant and Assistant Surgeon, Oct. 4, 1880; Captain and Assistant Surgeon, May 21, 1884.	N. Y.
Chaplain.				
.....	.....	.....	.....	.....
Inspector of Rifle Practice — Captain.				
Kasson C. Gibson, Sept. 6, 1886	....	.....	Private, Co. I, 71st Regt., April 22, 1872; transferred to Co. F, Oct. 15, 1873; transferred to Co. F, 7th Regt., Dec. 1, 1875; discharged Feb. 17, 1881; First Lieutenant and Quartermaster, 9th Regt., Jan. 11, 1886; Captain and Inspector of Rifle Practice, Sept. 6, 1886.	N. Y.
Supernumerary Officer Attached — Captain.				
G. Henry Witthaus, March 1, 1879	....	.....	.....	.....
Captains.				
Solomon E. Japha, July 12, 1875	....	E	.....	Private Co. E, 9th Regt., Sept. 30, 1871; Sergeant, Aug. 4, 1873; Second Lieutenant, Dec. 26, 1873; Captain, July 12, 1875.	N. Y.
George T. Lorigan, Jan. 11, 1883	....	A	Private, Co. G, 8th N. Y. S. militia, June 10, 1861; discharged Aug. 2, 1861.	Private, Co. H, 9th Regt., April 20, 1861; discharged June 10, 1861; Private, Co. G, 8th Regt., June 10, 1861; discharged Aug. 2, 1861; Private, Co. D, 8th Regt., March 4, 1862; Second Lieutenant, Jan. 16, 1866; First Lieutenant, Jan. 30, 1866; discharged Nov. 28, 1868; First Lieutenant, Co. F, 8th Regt., June 23, 1879; Captain, Co. A, 9th Regt., Jan. 11, 1883.	N. Y.

INFANTRY — NINTH REGIMENT — *(Continued).*

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Captains.				
Noah L. Cocheu, June 23, 1884	B	Second Lieutenant, Co. H, 53d N. Y. vols., from Oct. 2, 1861; First Lieutenant, from Oct. 2, 1861; mustered out March 21, 1862; Private, Co. F, 2d N. Y. vol. Cavalry; Second Lieutenant, 102d N. Y. vols., Aug. 30, 1863; First Lieutenant, 102d N. Y. vols., Nov. 16, 1863; discharged June 28, 1864; Brevet Captain, N. Y. vols.		N. Y.
Henry W. Leonard, Nov. 4, 1885	I		Captain, Co. I, 9th Regt., Nov. 4, 1885.	Ger.
William Wolcott Marks, Nov. 10, 1885,	F		Private, Co. F, 9th Regt., May 8, 1877; Company Quartermaster Sergeant, Feb., 1878; Second Lieutenant, Jan. 3, 1882; First Lieutenant, June 11, 1885; Captain, Nov. 10, 1885.	N. Y.
Theodore H. Swift, Dec. 15, 1885	D		Private, Co. K, 9th Regt., June 6, 1883; Corporal, Sept. 10, 1883; Second Lieutenant, Co. A, March 31, 1884; First Lieutenant, June 9, 1884; transferred to Co. D, S. O. No. 69, A. G. O., July 27, 1885; Captain, Co. D, Dec. 15, 1885.	N. Y.
William R. Clough, Dec. 22, 1885	H	Private, Co. G, 50th Mass. vols., Aug. 18, 1862; discharged Aug. 24, 1863.	First Lieutenant, Co. H, 9th Regt., March 10, 1882; Captain, Dec. 22, 1885.	N. H.

Harry A. Ely, June 17, 1887	C		Private, Co. A, 22d Regt., Dec. 23, 1872; dropped Oct. 29, 1873; taken up in Co. K Jan. 14, 1874; dropped June 23, 1875; taken up May 23, 1876; dropped June 22, 1880; Second Lieutenant, Co. C, 9th Regt., Dec. 23, 1886; Captain, June 27, 1887.	N. Y.
Washington Willcocks, Nov. 22, 1887,	G		Private, Co. G, 9th Regt., July 26, 1876; discharged August, 1881; reënlisted August, 1882; Sergeant, June 15, 1883; Second Lieutenant, Feb. 19, 1885; Captain, Nov. 22, 1887.	N. Y.
Joseph N. Billings, Nov. 23, 1887	K		Private, Co. K, 9th Regt., Nov. 3, 1880; Corporal, Jan. 5, 1881; Sergeant, July 12, 1882; Second Lieutenant, May 9, 1883; First Lieutenant, Nov. 12, 1884; Captain, Nov. 23, 1887.	N. Y.
First Lieutenants.				
Frederick S. Rice, April 25, 1882	G		Private, Co. G, 9th Regt., Oct. 18, 1870; Corporal, Nov. 16, 1875; Sergeant, Nov. 27, 1877; First Sergeant, May 7, 1878; Second Lieutenant, Nov. 4, 1878; First Lieutenant, April 25, 1882; resigned, Dec. 7, 1885; acceptance of resignation revoked, May 1, 1886.	N. Y.
Franklin Bartlett, April 4, 1884	E		First Lieutenant, Co. E, 9th Regt., April 4, 1884.	Mass
Robert Warrell, Nov. 10, 1885	F		Private, Co. F, 22d Regt., Dec. 21, 1880; Second Lieutenant, 9th Regt., June 11, 1885; First Lieutenant, Nov. 10, 1885.	N. Y.
Charles E. Kohlberger, Oct. 20, 1886	I		Private, Co. H, 96th Regt., Oct. 3. 1870; discharged Jan. 12, 1876; Private, Co. I, 9th Regt., Jan. 5, 1876; Sergeant, Dec. 1, 1878; First Sergeant, May 19, 1884; First Lieutenant, October 20, 1886.	Austria.
Second Lieutenants.				
Theodore S. Croft, Nov. 12, 1884	K	Private, 38th N.Y. vols., July, 1862; discharged Sept., 1864.	Quartermaster-Sergeant, Co. K, 9th Regt., Sept. 7, 1882; Second Lieutenant, Nov. 12, 1884.	N. Y.
John D. Walton, July 16, 1885	D		Private, Co. D, 9th Regt., Oct. 14, 1880; Corporal, Nov. 18, 1881; Sergeant, June 15, 1883; First Sergeant, Jan. 12, 1884; Second Lieutenant, July 16, 1885.	N. Y.

INFANTRY — NINTH REGIMENT — *(Continued).*

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Second Lieutenants.				
William H. Ehrmann, Nov. 10, 1885...	F	.....	Private, Co. E, 9th Regt., Oct. 23, 1878; Corporal, April 23, 1880; General Guide, 9th Regt., May 21, 1881; Regimental Quartermaster-Sergeant, Oct. 15, 1883; Second Lieutenant, Co. F, 9th Regt., Nov. 10, 1885.	Penn
James M. Maconnell, April 18, 1887...	H	.....	Private, Co. H, 9th Regt., June 7, 1886; Sergeant, Jan. 7, 1887; Second Lieutenant, April 18, 1887.	N. Y.
Emil J. Winterroth, June 15, 1887....	I	.....	Private, 9th Regt., May 18, 1885; Corporal, Jan. 12, 1887; Second Lieutenant, Co. I, June 15, 1887.	N. Y.
James G. McMurray, Oct. 17, 1887....	C	.....	Private, Co. C, 2d Regt., July 3, 1866; Corporal, 1867; Sergeant, 1868; Ordnance Sergeant of Regt., 1869; discharged by disbandment, Dec. 30, 1869; Private, Co. F, 22d Regt., Jan., 1870; Corporal, 1872; discharged Jan. 31, 1876; Second Lieutenant, 9th Regt., Oct. 17, 1887.	N. Y.

TENTH BATTALION — (Four Companies).

Third Brigade.

Armories of Companies at Albany.

Lieutenant-Colonel.				
William E. Fitch, Aug. 22, 1883	....	Private, 177th N. Y. vols., 10th N. G., S. N. Y., Oct. 11, 1862; First Sergeant, Oct. 11, 1862; honorably discharged, Sept. 10, 1863; State Brevet of Second Lieutenant, N. Y. vols.	Private, Co. E, 10th Regt., July 1, 1861; First Sergeant, May 15, 1862; Private, April 13, 1864; Adjutant May 11, 1867; First Lieutenant, Co. E, Sept. 28, 1871; honorably discharged Dec. 31, 1873; First Lieutenant Co. E, Feb. 13, 1874; Captain, Feb. 20, 1875; honorably discharged May 5, 1876; Private, Co. H. 10th Regt., Oct. 30, 1880; discharged by disbandment March 22, 1881; Private, Co. D, 10th Battalion, May 29, 1882; discharged March 1, 1883; Private, Co. D, June 1, 1883; Lieut.-Col., Aug. 22, 1883.	N. Y.
Major.				
Norton Chase, Feb. 18, 1886	....	....	First Lieutenant and Adjutant, 10th Battalion, Nov. 24, 1881; Major, Feb. 18, 1886.	N. Y.
Adjutant — First Lieutenant.				
James B. Sanders, April 1, 1886	....	....	Private, Co. A, 10th Regt., Jan. 28, 1879; Sergeant, June 22, 1882; discharged March 4, 1884; Private Co. A, 10th Battalion, March 16, 1884; Sergeant-Major, March 10, 1884; First Lieutenant and Adjutant, April 1, 1886.	N. Y.
Surgeon — Major.				
Lewis Balch, July 23, 1877	....	....	Captain and Assistant-Surgeon, 37th Regt., March 31, 1870; Captain and Assistant Surgeon, 71st Regt., Nov. 7, 1871; Major and Surgeon, 71st Regt., Oct. 1, 1872; resigned July 3, 1873; Major and Surgeon, 10th Regt., July 23, 1877; Supernumerary, Feb. 17, 1881; assigned to duty with 10th Battalion, Sept. 28, 1881.	N. Y.
Inspector of Rifle Practice — First Lieutenant.				
William T. Miles, Nov. 1, 1886	....	....	Private, Co. H, 10th Regt., Oct. 20, 1880; discharged by disbandment March 22, 1881; Private Co. D, 10th Battalion, May 29, 1882; Commissary Sergeant, Oct. 24, 1883; First Lieutenant and Inspector of Rifle Practice, Nov. 1, 1886.	N. Y.

INFANTRY — TENTH BATTALION — *(Continued).*

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Captains.				
Horatio P. Stacpole, Dec. 19, 1877; Brevet Major, Dec. 31, 1881.	B	.....	Private, Co. B, 10th Regt., May 6, 1867; Corporal, March 9, 1868; Quartermaster Sergeant, March 23, 1869; First Sergeant, April 16, 1870; First Lieutenant and Adjutant, Dec. 16, 1871; resigned Feb. 20, 1873; First Lieutenant, Co. B, Feb. 28, 1876; Captain, Dec. 19, 1877; Brevet Major, Dec. 31, 1881.	N. Y.
Edgar V. Denison, May 10, 1883.....	D	.....	Musician, 10th Regt., Feb. 1, 1864; discharged. 1872; Private, Co. B, 10th Regt., April 1, 1878; Corporal, Nov. 25, 1878; Ordnance Sergeant, 10th Battalion, Oct. 8, 1881; First Lieutenant. Co. D, 10th Battalion, Nov. 23, 1882; Captain, May 10, 1883.	N. Y.
James L. Hyatt, June 2, 1884.....	C	.....	Private, Co. D, 10th Regt., Nov. 24, 1874; Corporal, Aug. 19, 1875; Quartermaster Sergeant, Dec. 14, 1875; Private, Oct. 18, 1876; Regimental Quartermaster Sergeant, Feb. 17, 1877; Sergeant Major, April 6, 1880; discharged, Feb. 17, 1881; Private, Co. D, 10th Battalion, Sept. 23, 1881; Sergeant Major, Oct. 8, 1881; Second Lieutenant, Co. D, March 23, 1882; First Lieutenant, May 10, 1883; Captain, Co. K. June 2, 1884.	N. Y.
Albert J. Wing, March 22, 1886.....	A	.....	Private, Co. A, 10th Battalion, Jan. 3, 1881; Corporal, July 29, 1882; Sergeant, Feb. 1, 1883; First Sergeant, March 1, 1883; Second Lieutenant, Sept. 16, 1885; Captain, March 22, 1886.	N. Y.

First Lieutenants.				
Arthur W. Pray, Sept. 16, 1885	A		Private, Co. C, 4th Battalion Mass. vol. militia, April 18, 1874; Corporal, Sept., 1874; Color Sergeant of Battalion, Aug., 1875; Second Lieutenant, Jan. 17, 1876; First Lieutenant, Sept. 19, 1876; discharged Nov. 22, 1876; Private, Co. A, 10th Battalion, March 15, 1881; Sergeant, June 22, 1882; Second Lieutenant, Dec. 6, 1882; First Lieutenant, Sept. 16, 1885.	Mass.
Albion J. Kiernan, Dec. 10, 1885	D		Private, Co. D, 10th Battalion, Nov. 18, 1882; Quartermaster Sergeant, May 30, 1883; Sergeant, March 20, 1884; First Lieutenant, Dec. 10, 1885.	N. Y.
Samuel D. Hyatt, Feb. 25, 1886	C		Musician, Co. F, 10th Regt., Dec. 26, 1877; Drum Major, Nov. 9, 1880; discharged, March 22, 1881; Private, Co. D, 10th Battalion, Nov. 3, 1881; Corporal, Jan. 13, 1882; First Sergeant, March 1, 1883; discharged Aug. 6, 1883; Private, Co. K, 10th Battalion, Sept. 15, 1884; Second Lieutenant, Co. C, 10th Battalion, Jan. 8, 1885; First Lieutenant, Feb. 25, 1886.	N. Y.
G. James Greene, Oct. 15, 1887	B		Private, Co. B, 10th Regt., Nov. 13, 1879; Corporal, Jan. 4, 1881; dropped Nov. 30, 1881; taken up, Private, Co. B, 10th Battalion, June 6, 1884; Corporal, Sept. 7, 1885; Sergeant, Jan. 18, 1886; First Sergeant, May 3, 1886; Second Lieutenant, Nov. 13, 1886; First Lieutenant, Oct. 15, 1887.	N. Y.
Second Lieutenants.				
Anthime W. La Rose, July 10, 1884	D		Private, Co. D, 10th Battalion, Oct. 16, 1883; First Sergeant, Oct. 20, 1883; Second Lieutenant, July 10, 1884.	N. Y.
Albert L. Judson, May 10, 1886	A		Private, Co. A, 10th Battalion, April 11, 1883; Corporal, Sept. 23, 1883; Sergeant, March 20, 1884; First Sergeant, Oct. 5, 1885; Second Lieutenant, May 10, 1886.	N. Y.
James H. Edwards, June 10, 1886	C		Private, Co. D, 10th Battalion, June 11, 1883; discharged, Sept. 20, 1883; Private Co. C, 10th Battalion, Sept. 16, 1884; Corporal, Feb. 5, 1885; Second Lieutenant, June 10, 1886.	N. Y.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE. In Armies of the United States.	SERVICE. In the National Guard.	Born.
Second Lieutenant. Albert E. Batchelder, Nov. 12, 1887...	B	.....	Private, Co. B, 10th Battalion, Feb. 4, 1884; Corporal, Oct. 12, 1885; Sergeant, Jan. 11, 1886; First Sergeant, Nov. 29, 1886; Second Lieutenant, Nov. 12, 1887.	Wis.

ELEVENTH REGIMENT — (Nine Companies).

First Brigade.

Armory located at corner of Grand and Ludlow streets, New York city.

Colonel. Albert P. Stewart, June 1, 1885.....	....	Private, Co. K, 7th Regt., April 19, 1861, to June 3, 1861.	Private, Co. K, 7th N. Y. S. militia, April 19, 1861, to June 3, 1861; Commissary of Subsistence, 11th Regt., Nov. 21, 1872–73; Major, April 30, 1875; Lieutenant-Colonel, Sept. 15, 1876; resigned April 10, 1877; Lieutenant-Colonel, Feb. 8, 1884; Colonel, June 1, 1885.	N. Y.
Lieutenant-Colonel. William P. Walton, Sept. 9, 1885.....	....	Second Lieutenant, Co. D, 12th N. Y. vols., Feb. 3, 1862; honorably discharged for disability, Dec. 5, 1862.	Private, 37th N. Y. S. militia, March, 1861; Corporal, May, 1861; dropped Feb. 3, 1862; Second Lieutenant, Co. G, 1st Battalion, N. G. S. N. Y., Dec. 8, 1873; Captain, Jan. 6, 1874; Supernumerary, Aug., 1875; Captain, Co. F, 9th Regt., Aug. 17, 1875; Lieutenant-Colonel, 8th Regt., Sept. 9, 1885.	N. Y.
Major. Frank A. Jones, Aug. 21, 1885.....	....	.....	Private, Co. G, 7th Regt., Jan. 24, 1880; Major, 11th Regt., Aug. 21, 1885.	N. Y.
Adjutant—First Lieutenant. Philip Hazelton Williams, Nov. 7, 1885,	....	.....	Private, Co. F, 7th Regt., March 14, 1882; First Lieutenant and Adjutant, 11th Regt., Nov. 7, 1885.	N. Y.

Quartermaster—First Lieutenant.				
Frederick Yung, Sept. 30, 1885	....	.....	Private, Co. C, 55th Regt., honorably discharged Dec. 5, 1872; Private, Separate Troop K, June, 1876; First Lieutenant, Co. B, 11th Regt., Oct. 10. 1879; Quartermaster, Sept. 30, 1885.	Ger.
Commissary of Subsistence — First Lieutenant.				
.....	....	.....	.....	Ger.
Surgeon—Major.				
Wolfgang Goetz, Nov. 19, 1883	....	.....	First Lieutenant and Assistant Surgeon, April 23, 1883; Major and Surgeon, Nov. 19, 1883.	N. Y.
Assistant Surgeon—Captain.				
George William Collins, June 30, 1885,	....	.....	Captain and Assistant Surgeon, 11th Regt., June 30, 1885.	.....
Chaplain—Captain.				
.....	...	.....	.....	N. Y.
Inspector of Rifle Practice—Captain.				
Joseph Worster Hale, May 18, 1886	....	.....	Private, Co. G, 7th Regt., July 7,1876; Captain and Inspector of Rifle Practice, 11th Regt., May 18, 1886.	Ger.
Captains.				
Frederick Klonz, Oct. 30, 1862; Brevet Major, June 29, 1877	D	In 11th Regt. N. Y. State militia, from May 28 to Sept. 16, 1862; and in 11th Regt., N. G. S. N. Y., from June 16. 1863, to July 20, 1863.	Private, 11th Regt., 1857; Corporal, 1858; First Sergeant, 1859; First Lieutenant, Feb. 19, 1862; Captain, Oct. 30, 1862; retired April 19, 1881; on active duty from May 23, 1882.	
George Loesser, Sept. 30, 1880	K	.....	First Lieutenant, Co. F, 11th Regt., Oct. 11, 1878; Captain, Co. K, Sept. 30, 1880.	Ger.
Bernhard Ranft, March 13, 1883	H	.....	Private, Co. I, 3d Cavalry, June 13. 1879; Corporal, Oct., 1880; discharged Sept. 18, 1881; Private, Co. G, 11th Regt., Oct. 17, 1881; Captain, Co. H, March 13, 1883.	Ger.
Francis Albrecht, May 11, 1885	A	Private, Co. C, 1st United States Artillery, from May 22, 1869; discharged First Sergeant, July 22, 1874.	Private, Co. A, 1st Regt., July 29, 1871; discharged July 23, 1875, by disbandment; First Lieutenant, Co. H, 11th Regt., Jan. 12, 1885; Captain, Co. A, May 11, 1885.	Ger.
Theodore F. Schmidt, May 21, 1885	C	.....	Second Lieutenant, 11th Regt., April 19, 1883; Captain, May 21, 1885.	Ger.

INFANTRY—ELEVENTH REGIMENT—*(Continued).*

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Captains.				
Charles F. Surbrug, Oct. 12, 1885.....	I	In United States Navy, 1868 to 1873.	Private, Co. C, 11th Regt., July 22. 1882; Sergeant, Feb. 20, 1885; First Sergeant, May 20, 1885; Second Lieutenant, Co. I, August 14, 1885; Captain, Oct. 12, 1885.	Ohio
George W. Mooney, April 14, 1887.....	B	.....	Private, Co. F, 9th Regt., April 10, 1882; Corporal, Jan. 12, 1885; Second Lieutenant, Co. F, 11th Regt., Sept. 28, 1885; First Lieutenant, Co. B, Nov. 23, 1885. Captain, April 14, 1887.	Eng.
First Lieutenants.				
Joseph Obermeyer, June 12, 1882.....	C	.....	Private, Co. C, 11th Regt., Nov. 1, 1878; Corporal, Jan. 21, 1880; Sergeant, Aug. 4, 1880; First Sergt., Jan. 4, 1881; First Lieut., June 12, 1882.	Ger.
Richard A. Denahan, Oct. 5, 1885.....	F	.....	Private, Co. F, 9th Regt., Oct. 13, 1875; First Lieutenant, Co. F, 11th Regt., Oct. 5, 1885.	N. Y.
Charles H. Collins, Oct. 13, 1885	H	Second Lieutenant in Ottawa militia, Dominion of Canada.	First Lieutenant, Co. H, 11th Regt., Oct. 13, 1885.	N. Y.
Harold Christensen, Jan. 17, 1887.....	K	.....	Private, Co. A, 11th Regt., May 21, 1883; Corporal, Feb. 4, 1884; First Sergeant, May 5, 1885; Second Lieutenant, June 8, 1885; First Lieutenant, Co. K, Jan. 17, 1887.	Den.
Jarvis W. Mason, July 1, 1887.....	B	.....	Private, Co. F, 7th Regt., Dec. 12, 1882; Second Lieutenant, 11th Regt., Jan. 21, 1887; First Lieutenant, July 1, 1887.	N. Y.
George Fleischer, Sept. 1, 1887	I	.....	Private, Co. K, 71st Regt., March 12, 1885; Second Lieutenant, 11th Regt., Oct. 13, 1885; First Lieutenant, Co. I, Sept. 1, 1887.	N. Y.
Robert A. Elliott, Oct. 4, 1887.....	A	.....	Private, 12th Regt., April, 1885; First Lieutenant, 11th Regt., Oct. 4, 1887.	N. Y.

James M. Rankin, Oct. 10, 1887	G		Private, 23d Regt., Oct. 5, 1873; Corporal Co. B, Oct. 19, 1874; Sergeant, Jan. 6, 1875; Color-bearer, 23d Regt., April 2, 1883; Sergeant-Major, Feb. 11, 1884; honorably discharged June 2, 1886; First Lieutenant, Co. G, 11th Regt., Oct. 10, 1887.	N. Y.
Walter L. Miller, Nov. 9, 1887	D		Private, Co. D, 7th Regt., April 13, 1883; Second Lieutenant, 11th Regt., Jan. 26, 1887; First Lieutenant, Nov. 9, 1887.	N. Y.
Second Lieutenants.				
Louis Gumbart, March 11, 1886	F		Private, 1st Battalion, Feb. 21, 1870; discharged by disbandment, Aug., 1875; Private Co. F, 9th Regt., Aug. 17, 1875; discharged, Feb. 21, 1885; Private, Co. F, 11th Regt., Dec. 1, 1885; Second Lieutenant, March 11, 1886.	N. Y.
Louis L. Coudert, Jan. 17, 1887	K		Private, Co. F, 7th Regt., Dec., 1883; Second Lieutenant, 11th Regt., Jan. 17, 1887.	N. Y.
William J. Burns, Oct. 4, 1887	A		Private, Co. F, 22d Regt., April 6, 1885; Second Lieut., Co. A, 11th Regt., Oct 4, 1887.	N. Y.
Percy P. May, Nov. 18, 1887	B		Private, 22d Regt., Feb., 1886; Second Lieutenant, 11th Regt., Nov. 18, 1887.	Pa.
Warren F. H. Tupper, Nov. 30, 1887	D		Private, 7th Regt., Oct., 1884, Second Lieutenant, 11th Regt., Nov. 30, 1887.	N. Y.

TWELFTH REGIMENT (Ten Companies).

First Brigade.

Armory, Broadway, corner Ninth avenue and Sixty-first street, New York city.

Colonel.				
James H. Jones, Dec. 12, 1883	....	Second Lieutenant, 4th U. S. Cavalry, June 15, 1868; First Lieutenant, April 21, 1872; resigned Sept. 29, 1874.	Major, 12th Regt., Feb. 22, 1878; Lieutenant-Colonel, July 17, 1883; Colonel, Dec. 12, 1883.	N. Y.
Lieutenant-Colonel.				
Heman Dowd, April 29, 1885	....	Cadet, U. S. Mil. Academy, July 1, 1872; Second Lieutenant, 3d U. S. Artillery, June 15, 1876; First Lieutenant, 3d U. S. Artillery, Nov. 1, 1881; resigned June 1, 1883.	Lieutenant-Colonel, 12th Regt., April 29, 1885	N. Y.

INFANTRY—TWELFTH REGIMENT—*(Continued).*

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Major.				
John Jackson Riker, Jan. 9, 1884	....	.....	Private, Co. I, 7th Regt., May 26, 1878; First Lieutenant and Aide-de-Camp, 1st Brig., Aug. 7, 1879; Captain and Aide-de-Camp, April 1, 1880; Major and Inspector of Rifle Practice, May 19, 1880; resigned Feb. 18, 1881; Captain and Ordnance Officer, 1st Brig., Feb. 18, 1881; Major and Inspector, Oct. 27, 1882; honorably discharged, Oct. 25, 1883; Major, 12th Regt., Jan. 9, 1884.	N. Y.
Adjutant—First Lieutenant.				
Arthur F. Schermerhorn, Feb. 11, 1884,	....	.....	Private, Co. K, 7th Regt., Feb. 12, 1879; Corporal, Jan 26, 1881; Adjutant, 12th Regt., Feb. 4, 1884.	N. Y.
Quartermaster—First Lieutenant.				
Edward R. Powers, Jan. 30, 1882	....	.....	Commissary of Subsistence, 12th Regt., Jan. 18, 1879; Quartermaster, Jan. 30, 1882.	Mass
Com. of Subsistence—First Lieutenant.				
J. Emory Haskell, July 5, 1887	....	.....	Second Lieutenant, Co. A, 12th Reg., Dec. 8, 1884; First Lieutenant, Oct. 13, 1885; Captain, Co. C, April 19, 1886; First Lieutenant and Commissary of Subsistence, July 5, 1887.	N. Y.
Surgeon—Major.				
Nelson H. Henry, Jan. 23, 1885	....	.....	Assistant Surgeon 12th Regt., March 16, 1883; Captain and Assistant Surgeon, May 21, 1884; Major and Surgeon, Jan. 23, 1885.	N. Y.
Assistant Surgeon—Captain.				
Charles Lutellus Lindley, Jan. 23, 1885,	....	.....	Captain and Assistant Surgeon, 12th Regt., Jan. 23, 1885.	N. Y.
Chaplain—Captain				
William B. Frisbee, July 1, 1882	....	.....	Chaplain, 12th Regt., July 1, 1882	Md.
Inspector of Rifle Practice—Captain.				
.....	....	.....	.....	.....

Supernum'ary Officer Attached—Capt. James M. Brady, Oct. 27, 1871				
Captains.				
Charles S. Burns, Dec. 6, 1872	B	Private, Co. C, 79th N. Y. vols., May 3, 1861; discharged on account of wounds, Dec. 7, 1862; Private, Co. E, 76th Regt., Pa. vols., Oct. 1864; discharged July 18, 1865.	Private, Co. F, 12th Regt., Oct. 27, 1869; First Sergeant, Nov. 3, 1869; Second Lieutenant, Jan. 5, 1870, First Lieutenant, June 13, 1870; Captain, Co. B, Dec. 6, 1872.	Scot.
Henry C. Aspinwall, Nov. 24, 1880	I		Private, 22d Regt., Nov. 18, 1875; Corporal, Oct. 24, 1877; Company Quartermaster Sergeant, April 28, 1879; Second Lieutenant, Co. B, 12th Regt., May 7, 1880; Captain, Co. I, Nov. 24, 1880.	Eng.
William H. Kirby, Jr., June 20, 1882	G		Private, Co. A, 12th Regt., May 1, 1865; Corporal, Oct. 1, 1866; Regimental Quartermaster Sergeant, May 31, 1867; Sergeant-Major, Nov. 12, 1867; Second Lieutenant, Co. G, Feb. 7, 1871; First Lieutenant, Jan. 25, 1876; Captain, June 20, 1882.	N. Y.
Washington Content, March 27, 1883	H		Private, Co. A, 12th Regt., Nov. 15, 1880; Corporal, Dec. 16, 1880; Sergeant, Jan. 21, 1881; Second Lieutenant, Co. H, Sept. 6, 1881; First Lieutenant, March 14, 1882; Captain, March 27, 1883.	N. Y.
William H. Murphy, Dec. 20, 1883	F	Private, Co. A, 12th N. Y. S. militia, from May 2 to Aug. 5, 1861; Sergeant, from May 31 to Oct. 12, 1862.	Private, Co. A, 12th Regt., April 19, 1861; Sergeant, May, 1862; Private, Oct. 12, 1862; Sergeant, Nov. 3, 1862; Sergeant-Major, 12th Regt., Oct. 3, 1863; Adjutant, May 20, 1867; Captain, Co. F, Dec. 20, 1883.	Ire.
Bleecker S. Barnard, Aug. 1, 1884	D		Private, Co. D, 22d Regt., May 9, 1878; Corporal, Jan. 21, 1881; Sergeant, Feb. 15, 1882; First Sergeant, April 6, 1883; First Lieutenant, Co. H, 12th Regt., Feb. 5, 1884; Captain, Co. D, Aug. 1, 1884.	N. Y.

INFANTRY—TWELFTH REGIMENT—*(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Captains—(Continued).				
Howland Pell, Aug. 25, 1885	A		Private, Co. I, 7th Regt., June 7, 1875; honorably discharged, Sept. 7, 1881; Second Lieutenant, Co. E, 12th Regt., Feb. 8, 1884; First Lieutenant, Co. G, 12th Regt., June 3, 1884; Captain, Co. A, Aug. 25, 1885.	N. Y.
John F. Boylan, Oct. 26, 1885	K		Second Lieutenant, Co. F, 12th Regt., Nov. 19, 1883; First Lieutenant, Feb. 21, 1884; Captain, Co. K, Oct. 26, 1885.	N. J.
John Macaulay, Dec. 31, 1886	E		Private, Co. H, 12th Regt., Dec. 1, 1869; Corporal, Oct. 5, 1870; Second Lieutenant, Co. F, Feb. 21, 1884; First Lieutenant, Dec. 17, 1885; Captain, Co. E, Dec. 31, 1886.	Ire.
Rufus Delafield, Aug. 10, 1887	C		Second Lieutenant, Co. I, 12th Regt., May 22, 1864; First Lieutenant, July 23, 1885; Captain, Co. C, Aug. 10, 1887.	N. Y.
First Lieutenants.				
Samuel Parsons, April 7, 1885	H		Private, Co. K, 7th Regt., Oct. 24, 1879; Second Lieutenant, 12th Regt., Jan. 6, 1885; First Lieutenant, April 7, 1885.	N. Y.
Edward C. Smith, Dec. 28, 1885	A		Private, Co. A, 12th Regt., Jan. 4, 1882; promoted Corporal, June 22, 1882; First Sergeant, Dec. 28, 1882; First Lieutenant, Dec. 28, 1885.	Ire.
Frank Roosevelt, Aug. 27, 1886	E		Second Lieutenant, Co. E, 12th Regt., April 5, 1886; First Lieutenant, Aug. 27. 1886.	N. Y.
James W. Gerard, Jr., March 10, 1887,	F		Second Lieutenant, Co. F, 12th Regt., Jan. 15, 1886; First Lieutenant, March 10, 1887.	N. Y.
Charles M. Jessup, July 13, 1887	C		Private, 7th Regt., April, 1874; discharged April, 1885; Second Lieutenant, Co. C, 12th Regt., March 24, 1887; First Lieutenant, July 13, 1887.	N. Y.

Frederick Foster Carey, Sept. 29, 1887,	I	....	Private, Co. I, 12th Regt., July 23, 1885; Second Lieutenant, July 23, 1885; First Lieutenant, September 29, 1887.	N. Y.
Arthur E. Schuman, Oct. 18, 1887.....	G	....	Second Lieutenant, 11th Regt., Nov. 27, 1885; First Lieutenant, Oct. 25, 1886; resigned May 11, 1887; Second Lieutenant, 12th Regt., May 24, 1887; First Lieutenant, Oct. 18, 1887.	Ohio
Second Lieutenants.				
Harrie Cozzens Appleton, Dec. 28, 1883,	B	.....	Second Lieutenant, Co. B, 12th Regt., Dec. 28, 1883.	N. Y.
Edmund L. Knoedler, April 7, 1885...	H	.....	Private, Co. K, 7th Regt., Oct. 15, 1881; Second Lieutenant, 12th Regt., April 7, 1885.	N. Y.
Augustus Baus, Oct. 28, 1885.....	D	....	Second Lieutenant, Co. D, 12th Regt., Oct. 28, 1885.	N. Y.
J. Langdon Erving, May 12, 1887.....	F	.....	Private, Co. F, 7th Regt., Dec. 2, 1884; Second Lieutenant, 12th Regt., May 12, 1887.	N. Y.
Henry G. Paine, Aug. 26, 1887.....	E	.....	Private, Co. E, 12th Regt., May 26, 1887; Second Lieutenant, Aug. 26, 1887.	N. Y.
Louis G. Brigg, Aug. 29, 1887.....	K	.....	Private, Co. E, 7th Regt., April 17, 1882; Second Lieutenant, Co. K, 12th Regt., Aug. 29, 1887.	N. Y.
William F. Catterfield, Oct. 27, 1887.	I	....	Private, Co. I, 7th Regt., Oct. 2, 1883, Second Lieutenant, 12th Regt., Oct. 27, 1887.	N. Y.

Thirteenth Regiment (Ten Companies).

Second Brigade.

Armory at corner of Flatbush avenue and Hanson place, Brooklyn.

Colonel.				
David E. Austen, July 13, 1877.....	....	.....	Private, Co. H, 7th Regt., Feb. 14, 1859; Lieutenant, Co. I, 47th Regt., Nov. 4, 1862; Adjutant, 47th Regt., Aug. 10, 1863; Captain, Co. I, March 14, 1864; Major, 47th Regt., Oct. 16, 1865; Lieutenant-Colonel, Jan. 25, 1868; Colonel, May 9, 1868; Colonel, 13th Regt., July 13, 1877; Supernumerary, Dec. 3. 1883; Colonel, 13th Regt., Jan. 5, 1888, with original rank.	N. Y.

INFANTRY—THIRTEENTH REGIMENT—*(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Lieutenant-Colonel.				
.....	.....	.....	.....	.....
Major.				
J. Fred. Ackerman, March 27, 1885	.....	.....	Private, 13th Regt., Nov. 28, 1870; Corporal, April 7, 1873; Private, April 7, 1876; Inspector of Rifle Practice, Feb. 28, 1877; honorably discharged Dec. 3, 1879; First Lieutenant and Quartermaster, 13th Regt., July 22, 1880; Brevet Captain, Dec. 13, 1880; Major, March 27, 1885.	N. Y.
Adjutant—First Lieutenant.				
.....	.....	.....	.....	.....
Quartermaster—First Lieutenant.				
Charles W. Topping, Dec. 29, 1886	.....	Quartermaster Sergeant, 13th N. Y. Vol. Artillery, Dec. 27, 1863, to Aug. 15, 1865.	Private, Co. E, 13th Regt., Oct. 27, 1882; Corporal, May 1, 1883; Second Lieutenant, Feb. 15, 1884; transferred to Co. D, S. O. No. 60, A. G. O., June 30, 1885; discharged April 15, 1886; First Lieutenant and Quartermaster, 13th Regt., Dec. 29, 1886.	N. Y.
Commissary of Subsistence—First Lieutenant.				
Lewis M. Reed, Dec. 29, 1886	.....	.....	First Lieutenant and Commissary of Subsistence, 13th Regt., June 18, 1883; honorably discharged Dec. 9, 1886; First Lieutenant and Commissary of Subsistence, 13th Regt., Dec. 29, 1886.	N. J.
Surgeon—Major.				
Chas. E. De La Vergne, June 18, 1885	.....	.....	First Lieutenant and Assistant Surgeon, 13th Regt., Nov. 23, 1883; Captain and Assistant Surgeon, May 21, 1884; Major and Surgeon, June 18, 1885.	N. Y.
Assistant Surgeon—Captain.				
David F. Lucas, Dec. 29, 1886	.....	.....	Captain and Assistant Surgeon, 13th Regt., Dec. 29, 1886.	Can.
Chaplain—Captain.				
.....	.....	.....	.....	.....

Inspector of Rifle Practice—Captain.				
.....	.....	.....	.....	.....
Captains.				
William L. Watson, July 8, 1878.....	G	Private, Co. G, 21st Wisconsin vols., Aug. 20, 1862; Sergeant, Second and First Lieutenant and Captain; honorably discharged June 8, 1865.	Private, Co. E, 7th Regt., Aug. 15, 1871; discharged Aug. 15, 1878; Captain, Co. G, 13th Regt., July 8, 1878.	N. Y.
William J. Collins, Aug. 12, 1881.....	A	.....	Private, 13th Regt., Sept. 20, 1863; Corporal, Feb. 23, 1869; Sergeant, May 12, 1870; First Sergeant, Jan. 19, 1877; Second Lieutenant, Nov. 14, 1877; First Lieutenant, Oct. 15, 1878; Captain, Aug. 12, 1881.	Scot.
Richard P. Morle, Oct. 3, 1884.....	K	.....	Second Lieutenant, Co. F, 47th Regt., Oct. 6, 1873; First Lieutenant, Dec. 7, 1874; Captain, Dec. 3, 1877; Captain, Co. F, 13th Regt., July 20, 1880; discharged Sept. 8, 1882; Captain, Co. K, 13th Regt., Oct. 3, 1884.	Barbadoes
Charles O. Davis, Oct. 21, 1884.....	D	.....	Private, 13th Regt., Oct. 6, 1880; Sergeant, Sept. 13, 1881; Second Lieutenant, Dec. 18, 1882; First Lieutenant, Co. A, Jan. 21, 1884; Captain, Co. D, Oct. 21, 1884.	N. Y.
William Kerby, May 22, 1885.....	E	.....	Musician, Co. K, 14th Regt., Sept., 1873; transferred to Co. C, 23d Regt., Sept. 17, 1876; Second Lieutenant, Co. E, 13th Regt., Oct. 27, 1880; First Lieut., June 17, 1881; Captain, May 22, 1885.	N. Y.
Willoughby Powell, March 19, 1886...	B	.....	Private, Co. B, 7th Regt., July 6, 1857; transferred to Engineer Corps, 13th Regt., Nov. 5, 1860; First Sergeant, Co. F, 13th Regt., in 1861; First Lieutenant, Co. K, 13th Regt., May 27, 1862; Captain, April 2, 1863; was appointed Adjutant March 2, 1865; discharged Jan. 18, 1866; Captain, Co. B, 13th Regt., Mar. 19, 1886.	N. Y.
J. Frank Dillont, Feb. 4, 1887.....	F	.....	Private, Co. E, 7th Regt., April 3, 1874; First Lieut., 13th Regt., Aug. 17, 1875; Captain, Dec. 5, 1876; Major, March 12, 1880; Lieutenant-Colonel, July 29, 1880; discharged April 13, 1881; Captain, 13th Regt., Feb. 4, 1887.	Eng.

INFANTRY—THIRTEENTH REGIMENT—*(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Captains—(Continued).				
William Henry Albert Cochran, July 6, 1887,	H	.....	Private, Co. H, 13th Regt., April 21, 1883; Corporal, June 6, 1883; Second Lieutenant, Co. K, Nov. 11, 1885; First Lieutenant, Jan. 27, 1886; Captain, Co. H, July 6, 1887.	N. Y.
First Lieutenants.				
Robert Henry Sillman, March 11, 1884,	F	United States Military Academy cadet, August 28, 1883, to Jan. 8, 1884.	Private, Co. F, 13th Regt., Feb. 28, 1879; Corporal, Feb. 3, 1881; Sergeant, July 7, 1881; First Sergeant, Nov. 8, 1882; dropped August 28, 1883; First Lieutenant, Co. F, 13th Regt., March 11, 1884.	N. Y.
John T. Jennings, March 24, 1884.....	B	.....	Private, Co. B, 13th Regt., April 29, 1878; Corporal, July 20, 1880; Sergeant, Oct. 25. 1880; Second Lieutenant, Jan. 16, 1882; First Lieutenant, March 24, 1884.	N. Y.
John F. O'Connor, June 8, 1885.....	A	.....	Private, Co. G, 13th Regt., July 26, 1878; Corporal, Jan. 17, 1881; Sergeant, Feb. 4, 1884; discharged Oct. 24, 1884; Private, Third Battery, Oct. 27, 1884; Corporal, Jan. 5, 1885; First Lieutenant, 13th Regt., June 8, 1885.	N. Y.
William A. Brown, October 30, 1885...	E	Private, Co. B, 13th Regt., N. G. S. N. Y., May 28 to Sept. 4, 1862, and June 20 to July 20, 1863.	Private, Co. B, 13th Regt., May 28, 1862; Corporal, April 14, 1864; Sergeant, April 13, 1868; First Sergeant, Sept. 25, 1876; Second Lieutenant, Dec. 4, 1876; First Lieutenant, Oct. 25, 1879; Captain, Feb. 18, 1884; resigned Oct. 30, 1885; First Lieutenant, Co. E, 13th Regt., Oct. 30, 1885.	N. Y.
Charles P. Fish, December 28, 1885....	C	Lanarkshire Rifle vols., Glasgow, Scotland, March, 1880; served one year.	Private, Co. E. 13th Regt., May 13, 1882; Corporal, Sept. 5, 1882; transferred to Co. D, May 29, 1884; Corporal, June 2, 1885; First Lieutenant, Co. C, Dec. 28, 1885.	N. Y.

George G. Cochran, May 6, 1887	I		Second Lieutenant, Co. I, 13th Regt., June 4, 1886; First Lieutenant, May 6, 1887.	N. Y.
Second Lieutenants.				
Samuel T. Skinner, March 3, 1879	G	Private, Co. K, 13th Regt., N. G. S. N. Y., May 28 to Sept. 4, 1862.	Private, Co. K, 13th Regt., May 28, 1862: discharged Sept. 4, 1862; Private, Co. K, 13th Regt., April 27, 1865; transferred to Co. H, April 5, 1867; discharged Aug. 12, 1878; Second Lieutenant, Co. G, 13th Regt., March 3, 1879.	N. Y.
James Alexander, March 17, 1885	F		Second Lieutenant 13th Regt., March 17, 1885.	Eng.
William H. Coughlin, June 7, 1886	B		Private, Co. H, 13th Regt., March 1, 1862; First Lieutenant and Aide-de-Camp, 5th Brigade, April 5, 1870; Major and Inspector, Sept. 17, 1870; resigned June 24, 1872; Second Lieutenant, Co. B, 13th Regt., June 7, 1886.	N. Y.
Frederick G. Peoble, July 9, 1886	D		Private, 21st Separate Company, July 8, 1877; Corporal, May 2, 1878; Private, Dec. 7, 1878; discharged Nov. 7, 1882; Private, Co. E, 13th Regt., March 29, 1883; Corporal, Dec. 4, 1883; Sergeant, March 14, 1885; transferred to Co. D, June 12, 1885; Second Lieutenant, July 9, 1886.	N. Y.
Robert S. Copeland, Sept. 17, 1886	C		Second Lieutenant, Co. C, 13th Regt., Sept. 17, 1886.	N. Y.
Frank R. Wiswell, Aug. 16, 1887	A		Second Lieutenant, Co. A, 13th Regt., Aug. 16, 1887.	N. Y.
George C. Broome, Sept. 16, 1887	I		Brigade Sergeant and Color Bearer, 2d Brigade, M. V. M., Jan. 19, 1886; discharged Oct. 1, 1877; Second Lieutenant, Co. I, 11th Regt., Sept. 16, 1887.	N. Y.

INFANTRY—*(Continued).*

FOURTEENTH REGIMENT (Ten Companies).

Second Brigade.

Armory at corner of North Portland avenue and Auburn place, Brooklyn.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Colonel.				
Harry W. Michell, Nov. 30, 1885	. .	Private, 14th N. Y. S. militia (84th N. Y. vols.), April 18, 1861; Corporal, Aug. 1, 1861; Sergeant, Nov. 1, 1861; Second Lieutenant, Feb. 11, 1863; First Lieutenant, July 27, 1863; honorably disch'd March 12, 1865.	Private, Co. C, 14th Regt., April 18, 1861; Corporal, Aug. 1, 1861; Sergeant, Nov. 1, 1861; Second Lieutenant, Feb. 11, 1863; First Lieutenant, July 27, 1863; Captain, May 25, 1865; Major, 14th Regt., March 25, 1875; Lieutenant-Colonel, Oct. 29, 1883; Colonel, Nov. 30, 1885.	N. Y.
Lieutenant-Colonel.				
Selden C. Clobridge, Nov. 30, 1885	....	Private, Co. G, 115th N. Y. vols., Aug. 8, 1862; Corporal, Aug., 1862; Sergeant, Jan. 15, 1863; First Lieutenant, April 29, 1865; discharged (loss of right arm) June 5, 1865; Brevet Major, N. Y. S. vols.	Adjutant, 14th Regt., May 1, 1878; Major, Oct. 29, 1883; Lieutenant-Colonel, Nov. 30, 1885.	N. Y.
Major.				
John McNeill, Nov. 30, 1885	....	Sergeant, 14th N. Y. S. militia (84th N. Y. vols.), April 18, '61; First Sergeant, Aug. 10, 1861; Second Lieutenant, Feb. 15, 1862; Captain, Aug. 27, 1862; honorably disch'd June 6, 1864; Brev. Maj. U. S. vols.	Private, 14th Regt., Oct. 18, 1856; Corporal, Nov. 20, 1858; Sergeant, April 18, 1861; First Sergeant, Aug. 10, 1861; Second Lieutenant, Feb. 15, 1862; Captain, Aug. 27, 1862; Brevet Major; Major, Nov. 30, 1885.	Ire.

Adjutant — First Lieutenant.				
Alfred B. Campbell, Aug. 4, 1884	....	.....	Private, Co. K, 14th Regt., Jan. 14, 1878; Quartermaster-Sergeant, Oct. 12, 1881; Commissary Sergeant of Regt., Feb. 4, 1884; First Lieutenant, Co. K, Aug. 4, 1884; Adjutant, Oct. 13, 1886, with original rank.	N. Y.
Quartermaster — First Lieutenant.				
Alexander Barnie, Jr., Feb. 11, 1876	....	Corporal, Co. A, 14th N. Y. S. militia (84th N. Y. vols.), May 23, 1861; Regimental Quartermaster Sergeant, Sept. 1, 1861; honorably discharged June 6, 1864.	Private, Co. A, 14th Regt., Feb. 4, 1859; Corporal, April 18, 1861; Regimental Quartermaster Sergeant, Sept. 1, 1861; Quartermaster, Feb. 11, 1876.	N. Y.
Commissary of Subsistence — First Lieutenant.				
.....	....	.....	.....	.....
Surgeon — Major.				
J. Freeman Atwood, Jan. 3, 1887	....	.....	Major and Surgeon, 14th Regt., Jan. 3, 1887.	N. J.
Assistant Surgeon — Captain.				
Frank L. R. Tetamore, June 2, 1886	....	.....	Hospital Steward, 13th Regt., April 14, 1879; Captain and Assistant Surgeon, June 2, 1886.	N. Y.
Chaplain — Captain.				
J. Oramel Peck, May 22, 1882	....	.....	Captain and Chaplain, 14th Regt., May 22, 1882.	Vt.
Inspector of Rifle Practice — Captain.				
Ramon Cardóna, July 17, 1865	....	Corporal, 14th N. Y. S. militia (84th N. Y. vols.), April 18, 1861; Sergeant, August 10, 1861; Second Lieutenant, Feb. 26, 1862; First Lieutenant, Aug. 29, 1862; honorably discharged June 6, '64.	Private, 14th Regt., Sept. 10, 1856; Corporal, April 18, 1861; Sergeant, Aug. 10, 1861; Second Lieutenant, Feb. 26, 1862; First Lieutenant, Aug. 29, 1862; Captain, July 17, 1865; Captain and Inspector of Rifle Practice, Aug. 1. 1887, with original rank.	Spain
Captains.				
Benjamin S. Steen, Nov. 22, 1872	C	Corporal, 14th N. Y. S. militia (84th N. Y. vols.), April 22, 1861; Sergeant, Aug. 1, 1861; discharged (loss of right arm) Dec. 16, 1862.	Private, 14th Regt., Oct. 15, 1858; Corporal, April 22, 1861; Sergeant, Aug. 1, 1861; Second Lieutenant, May 27, 1865; First Lieutenant, Nov. 2, 1867; Captain, Nov. 22, 1872.	N. Y.
Joseph R. K. Barlow, March 22, 1880	E	.....	Private, 23d Regiment, Dec. 17, 1872; Second Lieutenant, 14th Regt., March 28, 1878; First Lieutenant, Sept. 11, 1878; Captain, Mar. 22, '80.	Mo.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Captains—(Continued).				
John J. Dixon, Jan. 10, 1884	A	Private, 144th N. Y. vols., May 18, 1862; Corporal, July 17, 1862; honorably discharged Aug. 25, 1865.	Private, 14th Regt., Feb. 10, 1866; Corporal, March 14, 1866; First Sergeant, June 5, 1866; Second Lieutenant, March 24, 1873; First Lieutenant, May 15, 1878; Captain, Co. A, Jan. 10, 1884.	.....
William V. Peacon, March 18, 1884	F	.....	Private, 13th Regt., Dec. 10, 1869; Color Bearer, March 17, 1871; discharged Sept. 15, 1877; Second Lieutenant, Co. K, 69th Regt., Oct. 13, 1882; Captain, Co. F, 14th Regt., Mar. 18, 1884.	Ire.
William F. Morris, April 24, 1884	K	.....	Private, 13th Regt., June 4, 1876; Sergeant, Oct. 4, 1877; First Sergeant, Sept. 10, 1878; First Lieutenant, 14th Regt., April 27, 1881; Captain, April 24, 1884.	Eng.
James M. White, June 3, 1884	B	.....	Private, 14th Regt., May 19, 1870; Sergeant, April 10, 1873; First Lieutenant, Sept. 2, 1879; Captain, June 3, 1884.	N. Y.
John Cutts, February 19, 1886	H	Private, 14th N. Y. S. militia (84th N. Y. vols.), April 18, 1861; discharged June 6, '64.	Private, 14th Regt., April 18, 1861; Corporal, April 15, 1866; Sergeant, Dec. 18, 1868; First Lieutenant, Dec. 17, 1872; Captain, Feb. 19, '86.	Eng.
Austin O. Crane, August 15, 1887	I	.....	Private, Co. I, 14th Regt., Nov. 12, 1873; Corporal, Aug. 8, 1876; First Sergeant, May 8, 1878; honorably discharged Dec. 6, 1880; re-enlisted same date; First Sergeant, May 14, 1883; Second Lieutenant, April 30, 1884; First Lieutenant, June 10, 1885; Captain, Aug. 15, 1887.	N. Y.
Edward Bennett, Sept. 22, 1887	G	.....	Private, Co. G, 14th Regt., Feb. 19, 1879; Sergeant, April 9, 1880; First Lieutenant, Jan. 21, 1884; Captain, April 20, 1885; resigned May 20, 1886; Captain, Co. G, Sept. 22, 1887.	Swe.

Hassell Nutt, October 10, 1887	D		Private, 14th Regt., April 2, 1873; Second Lieutenant, June 17, 1874; First Lieutenant, Co. I, May 26, 1876; Adjutant, May 1, 1885; Commissary of Subsistence, Oct. 13, 1886, with original rank; Captain, Co. D, Oct. 10, 1887.	Eng.
First Lieutenants.				
John H. Curran, May 26, 1882	E		Private, Co. E, 14th Regt., June 11, 1880; Corporal, Dec. 10, 1880; First Lieutenant, May 26, 1882.	N. Y.
Owen Lewis, June 19, 1882	C	Private, 73d N. Y. vols., Aug. 30, 1862; Sergeant, Dec. 13, 1862; discharged Dec. 22, 1864.	First Lieutenant, Co. D, 14th Regt., June 19, 1882; transferred to Co. C Oct. 29, 1884.	Eng.
Frank F. Thompson, June 10, 1884	B		Private, Co. B, 14th Regt., March 31, 1874; First Sergeant, Oct. 4, 1879; First Lieutenant, June 10, 1884.	Spain
George H. Rice, July 24, 1884	A	Corporal, Co. A, 84th N. Y. vols. (14th militia), April 24, 1861; Sergeant, June 13, 1861; discharged for disability Dec. 30, 1862.	Private, Co. A, 14th Regt. militia, Nov. 12, 1860; Corporal, April 24, 1861; Sergeant, June 13, 1861; discharged Dec. 30, 1862; First Lieutenant, Co. A, 14th Regt., July 24, 1884.	Eng.
Adolph L. Kline, March 16, 1885	D		Private, 14th Regt., May 24, 1876; Corporal, Sept. 13, 1878; Quartermaster Sergeant, Dec. 1, 1881; Second Lieutenant, Jan. 23, 1882; First Lieutenant, March 16, 1885.	N. J.
William R. Owens, May 7, 1886	H		Private, Co. H, 14th Regt., June 29, 1870; Corporal, March 11, 1873; Sergeant, Jan. 14, 1876; Second Lieutenant, June 13, 1884; First Lieutenant, May 7, 1886.	N. Y.
Alfred E. Steers, Nov. 15, 1886	K		Second Lieut., Co. K, 14th Regt., Sept. 27, 1886; First Lieutenant, Nov. 15, 1886.	N. Y.
Peter E. Erickson, Sept. 29, 1887	G		First Lieutenant, Co. G, 14th Regt., Sept. 29, 1887.	Swe.
Second Lieutenants.				
Thomas D. Henry, March 18, 1885	F		Private, Co. F, 14th Regt., May 2, 1879; Second Lieutenant, March 18, 1885.	Ire.
Gilbert Lloyd, October 16, 1885	E		Private, Co. B, 23d Regt., July 12, 1876; Corporal, April 3, 1878; Private, Co. D, 23d Regt., June 24, 1878; discharged Oct. 31, 1881; Second Lieutenant, Co. E, 14th Regt., Oct. 16, 1885.	N. Y.

INFANTRY—FOURTEENTH REGIMENT—*(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Second Lieutenants—(Continued).				
Charles C. Wallace, January 20, 1886..	I	.....	Private, Co. I, 14th Regt., March 3, 1885; Corporal, June 10, 1885; Sergeant, Dec. 7, 1885; Second Lieutenant, Co. I, Jan. 20, 1886.	N. Y.
John O. Soderstrom, Sept. 29, 1887....	G	.....	Private, Co. G, 14th Regt., Feb. 18, 1873; Corporal, March 15, 1874; Sergeant, June 23, 1875; First Sergeant, March 9, 1876; discharged March 24, 1884; Second Lieutenant, Co. G, 14th Regt., Sept. 29, 1887.	.....
Charles W. Bridges, October 17, 1887..	K	.....	Private, Co. K, 14th Regt., Jan. 14, 1878; Corporal, Dec. 12, 1879; Sergeant, Jan. 3, 1881; First Sergeant, Oct. 21, 1881; discharged Jan. 7, 1884; re-enlisted Feb. 4, 1886; First Sergeant, May 3, 1886; discharged March 7, 1887; Second Lieutenant, Oct. 17, 1887.	N. Y.

TWENTY-SECOND REGIMENT (Ten Companies).

First Brigade.

Armory, Fourteenth street, between Sixth and Seventh avenues, New York city.

Colonel.				
John T. Camp, January 18, 1886.....	....	As Sergeant, 22d N.G.S.N.Y., from May 28 to Sept. 5, 1862; Sergeant and First Lieutenant, 22d N. G. S. N. Y., from June 18 to July 24, 1863.	Private, Co. B, 22d Regt., Nov. 11, 1861; Sergeant, Dec. 9, 1861; First Lieutenant, June 27, 1863; Captain, March 25, 1867; Major, 22d Regt., Feb. 11, 1869; Lieutenant-Colonel, Oct. 11, 1869; honorably discharged Feb. 28, 1871; Lieutenant-Colonel, Dec. 22, 1873; Colonel, Jan. 18, 1886.	Mass.

Lieutenant-Colonel. William J. Harding, Feb. 8, 1886		Gunner, 1st Gloucester (England) Artillery vols., Battery D, July, 1860, to July, 1863; Private, Co. A, 7th N. H. vols., Oct. 14, 1863; Corporal, May 30, 1864; Sergeant, Dec. 22, 1864; First Lieutenant and Adjutant, 38th U. S. C. T., March 7, 1865; Captain, April 9, 1866; honorably discharged Mar. 18, '67.	Private, Co. B, 22d Regt., July 14, 1867; Adjutant, 22d Regt., Oct. 11, 1869; Captain, Jan. 7, 1873; honorably discharged Jan. 20, 1876; Adjutant, Aug. 1, 1877; Lieutenant-Colonel, Feb. 8, 1886.	Eng.
Major. George Alfred Miller, March 5, 1886			Private, Co. A, 22d Regt., Feb. 28, 1873; Corporal, Sept. 28, 1874; Sergeant, April 10, 1876; Second Lieutenant, March 14, 1881; Captain, May 2, 1881; Major, March 5, 1886.	N. Y.
Adjutant—First Lieutenant. William B. Smith, Sept. 8, 1886			Private, Co. E, 22d Regt., June 7, 1875; Sergeant, Feb. 26, 1877; First Sergeant, Feb. 18, 1880; Second Lieutenant, Oct. 20, 1880; First Lieutenant and Adjutant, Sept. 8, 1886.	N. Y.
Quartermaster—First Lieutenant. Thomas L. Miller, April 26, 1878			Private, Co. E, 22d Regt., Dec. 2, 1867; Corporal, May 10, 1871; Sergeant, May 13, 1872; Second Lieutenant, Feb. 11, 1874; First Lieutenant, Oct. 14, 1874; honorably discharged Nov. 30, 1877; Quartermaster, April 26, 1878.	N. Y.
Commissary of Subsistence—First Lieutenant. Joseph M. Smith, July 7, 1887			Private, Co. E, 22d Regt., March 5, 1877; Corporal, Feb. 18, 1881; Sergeant, March 28, 1884; Company Quartermaster Sergeant, April 1, 1886; Regimental Quartermaster Sergt., Aug. 23, 1886; Commissary of Subsistence, July 7, '87.	N. Y.
Surgeon—Major. William Freese Duncan, April 23, 1883,			Assistant Surgeon, 22d Regt., May 9, 1878; Captain and Surgeon, April 22, 1880; Major and Surgeon, April 23, 1883.	N. J.
Assistant Surgeon—Captain. Harry Marion Sims, May 21, 1884		Assistant Surgeon, 11th Field Ambulance Corps Société de Secours aux Blessés, French Army, Franco-Prussian campaign, 1870.	Assistant Surgeon, 22d Regt., May 12, 1876; removed from district, May 9, 1878; Assistant Surgeon, 22d Regt., Dec. 13, 1880; Captain and Assistant Surgeon, May 21, 1884.	N. Y.
Chaplain—Captain. William N. Dunnell, April 15, 1874			Chaplain, 22d Regt., April 15, 1874.	N. Y.

INFANTRY—TWENTY-SECOND REGIMENT—*(Continued).*

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Inspector of Rifle Practice—Captain.				
James Wells Finch, May 16, 1887	....	.....	Second Lieutenant, Co. C, 22d Regt., Sept. 30, 1885; Captain and Inspector of Rifle Practice, May 16, 1887.	N. Y.
Captains.				
William V. King, May 7, 1883	B	Private, 22d N. G. S. N. Y., from May 28 to Sept. 5, 1862.	Private, 22d Regt., May 28, 1862; discharged Sept. 5, 1862; First Lieutenant, 12th Regt., April 1, 1879; Captain, Nov. 28, 1881; transferred to 22d Regt. May 7, 1883.	N. Y.
George E. B. Hart, March 28, 1884	K	.....	Private, Co. K, 22d Regt., Dec. 19, 1879, Corporal, April 20, 1881; Second Lieutenant, 71st Regt., Jan. 27, 1882; resigned June 10, 1882; Private, 22d Regt., July 24, 1882; First Lieutenant, Nov, 15, 1882; Captain, March 28, 1884.	N. Y.
George Francis Demarest, Nov. 3,1884.	G	.....	Private, Co. A, 22d Regt., Feb., 1873; Corporal, March 19, 1874; Sergeant, Sept. 28, 1874; Second Lieutenant, June 1, 1876; Captain, March 11, 1878; discharged Oct. 12, 1880; Captain, Co. G, Nov. 3, 1884.	N. Y.
William H. Cortelyou, Dec. 19, 1884	D	.....	Private, Co. D, 22d Regt., Sept. 7, 1875; Corporal, Dec. 4, 1877; Sergeant, Dec. 10, 1878; First Sergeant, Aug. 20, 1881; Second Lieutenant, June 27, 1882; First Lieutenant, Dec. 19, 1882; Captain, Dec. 19, 1884.	Wis.
John P. Leo, February 18, 1885	I	....	Private, Co. H, 22d Regt., May 31, 1877; Sergeant, May 7, 1878; First Sergeant, Dec. 30, 1878; Second Lieutenant, Co. F, 71st Regt., April 13, 1881; First Lieutenant, Co. H, Dec. 6, 1881; Captain, Co. C, Nov. 3, 1882; Captain, 22d Regt., Feb. 18, 1885.	N. Y.

George F. Potter, June 18, 1885	H	Private, Corporal, Sergeant and Captain, Battery C, 13th N. Y. Vol. Artillery, 1861 to 1865.	Captain, Co. H, 22d Regt., June 18, 1885	N. Y.
William E. Preece, April 2, 1886	A		Private, Co. A, 22d Regt., Jan. 21, 1870; Corporal, Dec. 12, 1870; Sergeant, March 21, 1873; First Sergeant, March 19, 1874; First Lieutenant, Dec. 18, 1882; Captain, April 2, 1886.	N. Y.
Nathaniel B. Thurston, Dec. 20, 1886	E		Private, 22d Regt., Co. E, Aug. 6, 1877; Corporal, April 3, 1878; First Sergeant, Feb. 20, 1879; Second Lieutenant, Feb. 11, 1880; First Lieutenant, April 6, 1880; Captain, Dec. 20, 1886.	N. Y.
First Lieutenants.				
William J. Maidhoff, Nov. 22, 1880	B		Private, Co. G, 22d Regt., Nov. 6, 1871; Commissary Sergeant, 22d Regt., June 1, 1875; Sergeant Major, Dec. 8, 1876; First Lieutenant, Nov. 22, 1880.	N. Y.
Norman MacDonald, Nov. 12, 1883	C		First Lieutenant, Co. C, 22d Regt., Nov. 12, 1883.	N. Y.
Harry A. Beneke, March 28, 1884	K		Private, Co. B, 22d Regt., Nov. 15, 1880; Corporal, Dec. 12, 1881; Sergeant, Jan 17, 1883; First Lieutenant, Co. K, March 28, 1884.	N. Y.
Clarence M. Skellen, Sept. 17, 1885	H		Private, Co. D, 22d Regt., Oct. 6, 1876; Corporal, March 20, 1880; Left General Guide, 22d Regt., Nov. 8, 1880; Right General Guide, Feb. 9, 1883; Sergeant Major Sept. 26, 1883; First Lieutenant, Co. H, 22d Regt., Sept. 17, 1885.	N. Y.
J. G. B. Lilliendahl, Oct. 12, 1885	I		Private, Co. E, 22d Regt., May 5, 1880; Corporal, Jan. 19, 1881; Sergeant, Sept. 12, 1881; First Lieutenant, Co. I, 22d Regt., Oct. 12, 1885.	N. Y.
James R. Byrd, Feb. 9, 1886	F	Private, Co. G, 6th N. Y. vol. cav., Dec. 19, 1863; Sergeant, Sept. 1, 1864; Ordnance Sergeant, Nov. 1, '64; honorably discharged, Aug. 15, 1865.	Private, Co. F, 22d Regt., Oct. 4, 1881; Second Lieutenant, Co. G, 9th Regt., July 12, 1883; Captain, Feb. 17, 1885; resigned Feb. 26, 1886; First Lieutenant, Co. F, 22d Regt., Feb. 9, 1886.	N. Y.
James O'Neill, April 6, 1886	D		Private, Co. D, 22d Regt., Oct. 6, 1876; Corporal, Dec. 10, 1878; Sergeant, April 24, 1882; Second Lieutenant, Dec. 19, 1884; First Lieutenant, April 6, 1886.	N. Y.

INFANTRY—TWENTY-SECOND REGIMENT—*(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
First Lieutenants—(Continued).				
George C. Miller, May 24, 1886	G		Private, Co. F, 71st Regt., Mar. 12, 1873; transferred to Co. I; discharged March 4, 1878; Private, Co. G, 22d Regt., March 31, 1882; Corporal, April 6, 1883; Sergeant, Sept. 26, 1883; Second Lieutenant, Sept. 1, 1884; First Lieutenant, May 24, 1886.	N. Y.
John A. Quigley, May 4, 1887	E		Private, Co. E, 22d Regt., April 6, 1883; Corporal, Sept. 22, 1884; Sergeant, Jan. 27, 1886; First Sergeant, Jan. 25, 1887; First Lieutenant, May 4, 1887.	N. Y.
James P. Kenworthy, May 6, 1887	A		Private, Co. A, 22d Regt., Sept. 7, 1874; Corporal, Feb. 26, 1877; Sergeant, Feb. 24, 1879; First Sergeant, Feb. 28, 1883; First Lieutenant, May 6, 1887.	N. Y.
Second Lieutenants.				
Adolph E. Dick, April 20, 1881	H	Private, Co. B, 184th N. Y. vols., July 22, 1864; honorably discharged, June 7,'65.	Drummer, Oswego Light Guard, late 48th N. G. S. N. Y., May 1, 1861; dropped July, 1864; Private, 49th Regt., 1873; dropped July, 1874; Private, Co. C, 22d Regt., May 1, 1875; 2d Lieut. April 20,1881; transferred to Co.H.,Dec.27,1885.	Ger.
Thomas F. Ryder, May 19, 1885	F		Private, Co. F, 22d Regt., Oct. 1, 1878; Second Lieutenant, May 19, 1885.	N. J.
Charles A. DuBois, October 12, 1885	I		Private, Co. E, 22d Regt., June 28, 1862; Quartermaster Sergeant, 22d Regt., June 8, 1875; Second Lieutenant, Co. I, Oct. 12, 1885.	N. Y.
Robert J. Daly, April 8, 1886	K		Private, Co. K, 22d Regt., Oct. 4, 1881; Sergeant, Jan. 17, 1883; First Sergeant, Dec. 28, 1885; Second Lieutenant, April 8, 1886.	Ire.
Alfred H. Murphy, Sept. 20, 1886	G		Private, Co. G, 22d Regt., Dec. 23, 1881; Corporal, April 13, 1883; Sergeant, May 5, 1884; Second Lieutenant, Sept. 20, 1886.	N. Y.

Ellsworth R. De Bow, Nov. 9, 1886....	D	.....	Private, Co. D, 22d Regt., Oct. 7, 1879; Corporal, Feb. 20, 1885; Quartermaster-Sergeant, Sept. 6, 1885; Second Lieutenant, Nov. 9, 1885.	N. Y.
William N. Bavier, Nov. 22, 1886.....	B	.....	Private, Co. B, 22d Regt., Nov. 6, 1876; First Sergeant, Dec. 12, 1881; discharged Nov. 23, 1885; Private, Co. B, 22d Regt., Nov. 24, 1885; Sergeant, Nov. 25, 1885; Second Lieutenant, Nov. 22, 1886.	N. Y.
Walter D. Haws, Dec. 20, 1886.....	E	.....	Private, Co. E, 22d Regt., Dec. 6, 1882; Sergeant, June 15, 1886; Second Lieutenant, Dec. 20, 1886.	N. Y.
John Lamb, Dec. 27, 1886	A	.....	Private, Co. K, 22d Regt., Nov. 23, 1880; Quartermaster-Sergeant, June 9, 1882; returned to the ranks June 15, 1883; Corporal, June 15, 1884; Sergeant, Dec. 4, 1884; discharged Nov. 22, 1886; Second Lieutenant, 22d Regt., Dec. 27, 1886.	N. Y.
Malcolm C. Murray, July 11, 1887.....	C	.....	Private, Co. C, 22d Regt., April 7, 1884; First Sergeant, Nov. 23, 1885; Second Lieutenant, July 11, 1887.	N. Y.

TWENTY-THIRD REGIMENT (Ten Companies).

(Second Brigade.)

Armory, Clermont avenue near Myrtle avenue, Brooklyn.

Colonel.				
John N. Partridge, Oct. 17, 1887.....	....	.....	.....	.....
Lieutenant-Colonel.				
Alexis C. Smith, Dec. 5, 1887	....	.....	Private, Co. A, 23d Regt., March 1, 1876; Corporal, Sept. 4, 1878; Sergeant, June 4, 1879; First Sergeant, Co. H, Sept. 4, 1879; First Lieutenant, March 5, 1880; Captain, Co. H, Oct. 16, 1882; Lieutenant-Colonel, 23d Regt., Dec. 5, 1887.	N. Y.

INFANTRY—TWENTY-THIRD REGIMENT—*(Continued).*

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Major.				
Charles E. Waters. April 19, 1886			Private, 23d Regt., Jan. 7, 1874; Corporal, March 1, 1875; Sergeant, May 15, 1876; First Sergeant, Aug. 7, 1878; First Lieutenant, May 6, 1879; Captain, Co. K, March 4, 1880; Major, April 19, 1886.	N. Y.
Adjutant—First Lieutenant.				
Eugene W. Burd, October 16, 1885			Private, 22d Regt., June 6, 1870; transferred to 13th Regt., Sept. 13, 1871; transferred to 23d Regt., Nov. 25, 1873; Corporal, Sept. 1, 1875; Sergeant-Major, Sept. 27, 1875; Second Lieutenant, Dec. 30, 1875; First Lieutenant, Sept. 4, 1879; Adjutant, Jan. 26, 1880; Captain, Co. E, March 26, 1884; resigned Oct. 16, 1885; Adjutant, 23d Regt., Oct. 16, 1885.	N. Y.
Quartermaster—First Lieutenant.				
Arthur A. Thompson, Sept. 18, 1882			Private, 23d Regt., Sept. 3, 1877; Left General Guide, July 3, 1879; Right General Guide, Sept. 6, 1880; First Lieutenant and Quartermaster, Sept. 18, 1882.	Mass.
Commissary of Subsistence—First Lieutenant.				
Richard Oliver, May 12, 1884		Private, Co. G, 7th Regt., N. Y. S. militia, April 19 to June 3, 1861; Second Lieutenant Co. E, 13th Regt. N. G. S. N. Y., May 24 to Sept. 1862.	Private, Co. G, 7th Regt., April 19 to June 3, 1861; Second Lieutenant, Co. E, 13th Regt., May 24, 1862, to May 20, 1865; Commissary of Subsistence, 23d Regt., May 12, 1884.	Eng.
Surgeon—Major.				
William E. Spencer, Nov. 28, 1887			Private, Co. D, 23d Regt., June 12, 1879; Hospital Steward, Oct. 24, 1881; Captain and Assistant Surgeon, April 26, 1886; Major and Surgeon, Nov. 28, 1887.	Pa.
Assistant Surgeon—Captain.				
Henry L. Cochran, Nov. 28, 1887			Private, Co. A, 23d Regt., Nov. 16, 1881; Hospital Steward, 23d Regt., May 19, 1886, Captain and Assistant Surgeon, Nov. 28, 1887.	N. Y.

Chaplain — Captain.				
Geo. R. Van de Water, May 24, 1886	....	.....	Captain and Chaplain, 23d Regt., May 24, 1886.	N. Y.
Inspector of Rifle Practice — Captain.				
.....	....	.....	.....	.....
Captains.				
Ezra De Forest, January 29, 1883	C	.....	Private, 23d Regt., Oct. 19, 1872; Corporal, March 2, 1874; Sergeant, Feb. 28, 1876; First Sergeant, Dec. 4, 1876; First Lieutenant, April 14, 1879; Captain, Jan. 29, 1883.	Conn
Willard L. Candee, October 17, 1883	B	.....	Private, 23d Regt., June 21, 1875; Sergeant, Co. C, Jan. 8, 1877; First Sergeant, May 5, 1879; Second Lieutenant, Co. B, April 4, 1880; First Lieutenant, Dec. 13, 1882; Captain, Co. B, Oct. 17, 1883.	N. Y.
Fred. C. Cocheu, January 26, 1885	D	.....	Second Lieutenant, Co. D, 23d Regt., Aug. 18, 1884; Captain, Jan. 26, 1885.	N. Y.
Harold L. Crane, March 13, 1885	G	.....	Private, 23d Regt., March 10, 1864; First Lieutenant and Quartermaster, 56th Regt., Jan. 16, 1869; First Lieutenant and Aide-de-Camp, 11th Brigade, March 17, 1870; Captain and Aide-de-Camp, May 13, 1871; Captain and Quartermaster, Dec. 12, 1872; resigned April 21, 1876; Private, Co. G, 23d Regt., Oct. 23, 1877; Company Quartermaster-Sergeant, April 21, 1879; Second Lieutenant, Oct. 8, 1879; First Lieutenant, Feb. 27, 1880; Captain, March 13, 1885.	N. Y.
Frederick L. Holmes, June 3, 1885	I	.....	Private, Co. B, 23d Regt., April 24, 1879; Second Lieutenant, Nov. 12, 1879; First Lieutenant, March 10, 1880; resigned Nov. 15, 1882; Second Lieutenant, Dec. 10, 1884; First Lieutenant and Adjutant, March 21, 1885; Captain, Co. I, June 3, 1885.	Ohio
Britton C. Thorn, March 30, 1886	F	.....	Private, Co. F, 23d Regt., Oct. 5, 1875; Corporal, Dec. 2, 1879; Sergeant, Jan. 10, 1882; First Sergeant, June 6, 1882; First Lieutenant, Nov. 18, 1884; Captain, March 30. 1886.	N. Y.

INFANTRY—TWENTY-THIRD REGIMENT—*(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Captains (Continued).				
Darwin R. Aldridge, Sept. 2, 1886	K		Private, 23d Regt., July 11, 1878; Corporal, Oct. 20, 1879; Second Lieutenant, Co. K, Dec. 29, 1881; First Lieutenant, Jan. 17, 1884; Captain, Sept. 2, 1886.	N. J.
Charles F. Guyon, May 12, 1887	E		Private, Co. G, 23d Regt., July 4, 1874; Corporal, Dec. 1, 1875; Sergeant, Dec. 5, 1879; Captain and Aide-de-Camp, 4th Brigade, Oct. 20, 1884; Major and Commissary of Subsistence, Jan. 5, 1885; Major and Inspector, April 21, 1886; rendered supernumerary, Aug. 5, 1886; Captain, Co. E., 23d Regt., May 12, 1887.	N. Y.
Henry C. Everdell, Dec. 14, 1887	A		Private, Co. A., 23d Regt., June 25, 1879; Corporal, April 7, 1880; Sergeant, Feb. 8, 1882; First Lieutenant, Feb. 19, 1886; Captain, Dec. 14, 1887.	N, Y.
First Lieutenants.				
John S. Shepherd, Feb. 9, 1885	D		Private, 23d Regt., Sept. 12, 1878; Corporal, April 7, 1879; Sergeant, Feb. 20, 1882; Second Lieutenant, Co. D, Dec. 11, 1882; First Lieutenant, Feb. 9, 1885.	Mass
George E. Hall, March 13, 1885	G		Private Co. G, 23d Regt., Oct. 14, 1881; Corporal, Dec. 7, 1883; Sergeant, Dec. 5, 1884; Second Lieutenant, 23d Regt., Jan. 2, 1885; First Lieutenant, March 13, 1885.	N. H.
William S. Banta, Nov. 16, 1885	C		Private, 23d Regt., July 13, 1874; Corporal, Jan. 8, 1877; Sergeant, May 5, 1879; First Sergeant, Aug. 2, 1880; Second Lieutenant, Co. C., Jan. 29, 1883; First Lieutenant, Nov. 16, 1885.	N. Y.
G. W. Middleton, Jr., Jan. 21, 1886	I		Private, Co. I, 23d Regt., March 30, 1882; Corporal, Nov. 2, 1882; Second Lieutenant, March 3, 1884; First Lieutenant, Jan 21, 1886.	N. Y.

Joseph T. Hull, June 7, 1886	F		Private, 23d Regt., June 11, 1867; Corporal, Co. I, July 6, 1869; Sergeant, March 7, 1871; First Sergeant, Nov. 7, 1871; transferred to Co. F, Oct. 20, 1874; Sergeant, Dec. 1, 1874; discharged April 23, 1877; Second Lieutenant, March 17, 1885; First Lieutenant, June 7, 1886.	N. Y.
Arthur C. Saunders, Jan. 17, 1887	K		Private, Co. D, 23d Regt., Jan. 17, 1876; Corporal, May 9, 1878; Sergeant, August 12, 1880; Second Lieutenant, Feb. 9, 1885; First Lieutenant, Co. K, January 17, 1887.	N. Y.
Wm. Passmore Pickett, May 2, 1887	B		Private, Co. B, 23d Regt., March 5, 1880; discharged March 30, 1885; Second Lieutenant, Co. B, 23d Regt., Oct. 7, 1885; First Lieutenant, May 2, 1887.	Conn.
William A. Underhill, June 17, 1887	E		Private, 23d Regt., June 17, 1875; Corporal, April 3, 1877; Sergeant, Dec. 3, 1878; First Sergeant, April 28, 1879; discharged Nov. 8, 1880; re-enlisted Aug. 29, 1881; First Sergeant same day; discharged Mar. 26, 1883; re-enlisted Jan. 12, 1886; First Lieutenant, Co. E, June 17, 1887.	N. Y.
George A. Williams, July 11, 1887	H		Private, Co. H, 23d Regt., Co. Quartermaster Sergeant, Oct. 30, 1882; Sergeant, Dec. 21, 1883; First Sergeant, Dec. 15, 1884; Second Lieutenant, Dec. 18, 1885; First Lieut., July 11, 1887.	N. Y.
Second Lieutenants.				
Theodore W. Sillcocks, March 13, 1885,	G		Private, Co. G, 23d Regt., Oct. 4, 1880; Corporal, Jan. 6, 1882; Sergeant, Dec. 5, 1884; Second Lieutenant, March 13, 1885.	N. Y.
Chas. R. Silkman, Jan. 18, 1886	C		Private, Co. C, 23d Regt., Feb. 20, 1882; Corporal, Dec. 18, 1882; Sergeant, June 1, 1885; Second Lieutenant, Jan. 18, 1886.	N. Y.
George F. Hamlin, Jan. 21, 1886	I		Private, Co. K, 23d Regt., Sept. 29, 1881; Corporal, Dec. 7, 1882; Private, Oct. 15, 1883; transferred to Co. I, March 12, 1884; First Sergeant, April 15, 1884; Second Lieutenant, Jan. 21, '86.	N. Y.
William H. B. Smith, Feb. 19, 1886	A		Private, Co. A, 23d Regt., May 30, 1881; Corporal, May 15, 1882; Sergeant, Dec. 19, 1883; First Sergeant, Sept. 3, 1884; Second Lieutenant, Feb. 19, 1886.	N. Y.

NAME, GRADE, AND DATE OF RANK.	Company.	SERVICE. In Armies of the United States.	SERVICE. In the National Guard.	Born.
Second Lieutenants (Continued).				
Robert T. Holly, Sept. 13, 1886	F		Private, Co. F, 23d Regt., Sept. 2, 1873; Corporal, March 22, 1876; Private, Dec. 6, 1880; Second Lieutenant, Sept. 13, 1886.	Conn
David K. Case, Jan. 17, 1887	K		Private, Co. K, 23d Regt., April 14, 1881; promoted Corporal, Oct. 12, 1882; Sergeant, Nov. 15, 1883; First Sergeant, April 3, 1884; Second Lieutenant, Jan. 17, 1887.	N. Y.
Edward J. Kraft, March 7, 1887	D		Private, Co. D, 23d Regt., Jan. 10, 1878; Corp. April 7, 1879; Sergeant, Nov. 9, 1882; 1st Sergt., Nov. 3, 1884; 2d Lieutenant, March 7, 1887.	N. Y.
Thomas M. Close, May 11, 1887	B		Private, Co. B, 23d Regt., Dec. 21, 1879; Corporal, Jan. 26, 1881; Sergeant, May 18, 1885; Second Lieutenant, May 11, 1887.	N. Y.
Clarence E. Hubbard, July 11, 1887	H		Private, Co. H, 23d Regt., June 23, 1879; Corp. Nov. 2, 1883; Sergeant, Oct. 3, 1884; 1st Sergt., Jan. 15, 1886; 2d Lieutenant, July 11, 1887.	Conn
Forbes Dunderdale, July 15, 1887	E		Private, 23d Regt., Aug. 7, 1877; discharged July 11, 1883; re-enlisted Dec. 1, 1885; Second Lieutenant, Co. E, July 15, 1887.	N. Y.

THIRTY-SECOND REGIMENT (Nine Companies).

(Second Brigade).

Armory, corner Bushwick boulevard and Stagg street, Brooklyn.

Colonel.				
Louis Finkelmeier, Oct. 8, 1881	....	Private, Co. B, 20th N. Y. vols,; Corporal and Sergeant; First Sergeant, Dec. 26, 1862; discharged, expiration of service, June 1, 1863.	First Lieutenant, 32d Battalion, Oct. 8, 1868; Captain, 32d Regt., Sept. 14, 1872; Major, Dec. 19, 1876; Lieutenant-Colonel, Mar. 29, 1881; Colonel, Oct. 8, 1881.	Ger.

Lieutenant-Colonel.				
.....	.....	.....	.....	.....
Major.				
.....	.....	.....	.....	.....
Adjutant — First Lieutenant.				
Wm. Van der Clute, Jr., Feb. 15, 1884,	.....	.....	Private Co. I, 32d Regt., Mar. 16, 1877; First Sergeant, Oct. 1, 1877; discharged Apr. 7, 1882; First Sergeant, Apr. 7, 1882; discharged Apr. 7, 1883; reënlisted and reappointed First Sergeant, Apr. 7, 1883; Adjutant, 32d Regt., Feb. 15, 1884.	N. Y.
Quartermaster — First Lieutenant.				
Jacob R. Teel, April 8, 1887.....	.....	.....	Private, Co. E, 13th Regt., Sept, 25, 1885; Quartermaster-Sergeant, Dec. 30, 1885; First Lieutenant and Quartermaster, 32d Regt., Apr. 8, 1887.	N. J.
Commissary of Subsistence — First Lieutenant.				
George Zechiel, Jan. 26, 1885.....	.....	.....	First Lieutenant and Commissary of Subsistence, 32d Regt., Jan. 26, 1885.	N. Y.
Surgeon — Major.				
John F. Valentine, April 23, 1883.....	.....	.....	First Lieutenant and Assistant Surgeon, 32d Regt., July 26, 1879; Captain and Surgeon, April 12, 1882; Major and Surgeon, Apr. 23, 1883.	N. Y.
Assistant Surgeon — Captain.				
Frederick G. Winter, May 7, 1886.....	.....	.....	Captain and Assistant Surgeon, 32d Regt., May 7, 1886.	Me.
Chaplain — Captain.				
Emil Arnold Meury, Sept. 30, 1887.....	.....	.....	Chaplain, 32d Regt., Sept. 30, 1887.	.....
Inspector of Rifle Practice — Captain.				
Van D. Macumber, April 25, 1887.....	.....	.....	Second Lieutenant, 13th Regt., Nov. 28, 1886; Captain and Inspector of Rifle Practice, 32d Regt., Apr. 25, 1887; Private, Co. E, 13th Regt., June 18, 1885; First Sergeant, June 18, 1885; Second Lieutenant, Nov. 26, 1886; Captain and Inspector of Rifle Practice, 32d Regt., Apr. 25, 1887.	Ohio

INFANTRY—THIRTY-SECOND REGIMENT—*(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Captains.				
Charles Waage, March 29, 1876; Brevet Major, December 4, 1879	F	Private, Co. A, 47th N. Y. vols., Sept. 10, 1861; prisoner of war; honorably discharged Feb. 15, 1865.	Second Lieutenant, 52d Regt., June 20, 1866; disbanded June 5, 1868; Second Lieutenant, 32d Battalion, Sept. 11, 1868; First Lieutenant, 32d Regt., Sept. 16, 1870; Captain, March 29, 1876.	Ger.
William F. Grotz, March 27, 1878	H		Private, Co. I, 32d Regt., March 16, 1877; First Lieutenant, May 8, 1877; Captain, Co. H, March 27, 1878.	N. Y.
Edward Verdeckberg, March 31, 1882,	D		Private, Co. H, 47th Regt., April 3, 1878: First Lieutenant, Co. D, 32d Regt., Nov. 18, 1881; Captain, March 31, 1882.	N. Y.
Emil Brogglewirth, December 28, 1883,	C		Private, Co. H, 32d Regt., Oct. 29, 1877; Second Lieutenant, March 27, 1878; First Lieutenant, April 12, 1879; Captain, Co. E, Dec. 13, 1880; resigned, April 6, 1881; First Lieutenant and Adjutant, 32d Regt., April 6, 1881; Captain, Co. C, Dec. 28, 1883.	N. Y.
George H. Bishop, December 23, 1884	A		Private, Co. F, 47th Regt., Aug. 7, 1871; Corporal, March 1, 1875; Sergeant, Jan. 7, 1878; Private, Aug. 7, 1878; First Sergeant, March 3, 1879; discharged Dec. 20, 1881; Private, July 27, 1882; discharged Dec. 5, 1883; Captain, Co. A, Dec. 23, 1884.	N. Y.
John J. Klein, October 29, 1886	G		Private, Co. G, 32d Regt., June 12, 1875; Company Quartermaster Sergeant, March 1, 1876; First Sergeant, Nov. 16, 1878; Second Lieutenant, Feb. 3, 1879; First Lieutenant, Oct. 29, 1881; Captain, Oct. 29, 1886.	N. Y.

Edward J. Renison, Aug. 9, 1887.....	B	.....	Private, Co. E, 13th Regt., Dec., 1879; Corporal, May, 1883; Sergeant, Oct., 1885; First Lieutenant, Co. D, 32d Regt., April 30, 1886; Captain, Co. B, Aug. 9, 1887.	N. Y.
First Lieutenants.				
Maxwell C. Burger, February 10, 1885,	K	.....	Private, Co. K, 32d Regt., Dec. 2, 1870; discharged April 15, 1881; First Lieutenant, Feb. 10, 1885.	N. Y.
William D. Wood, April 10, 1885.....	A	.....	Private, Co. A, 32d Regt., Oct. 31, 1883; Second Lieutenant, Jan. 8, 1884; First Lieutenant, April 10, 1885.	N. Y.
James H. Russell, April 27, 1886.....	H	.....	Private, Co. H., 32d Regt., March 24, 1882; Quartermaster Sergeant, Oct. 19, 1883; First Sergeant, March 17, 1884; First Lieutenant, April 27, 1886.	N. Y.
John J. Elzenbeck, February 23, 1887.	I	.....	Private, Co. I, 32d Regt., June 19, 1877; Corporal, April 12, 1879; Sergeant, March 18, 1882; honorably discharged and reënlisted July 21, 1882; First Sergeant, April 23, 1884; Second Lieutenant, May 22, 1885; First Lieutenant, Feb. 23, 1887.	N. Y.
Robert H. McKittrick, June 24, 1887 ..	C	.....	Private, Co. E, 13th Regt., Oct. 1, 1886; Second Lieutenant, 32d Regt., April 15, 1887; First Lieutenant, June 24, 1887.	Ct.
Charles G. Schoeneck, August 26, 1887	F	.....	Private, Co. K, 13th Regt., June 6, 1879; Corporal, Jan. 2, 1880; Sergeant, Jan. 10, 1883; General Guide, Dec. 26, 1884; honorably discharged Feb. 18, 1887; First Lieutenant, Co. F, 32d Regt., Aug. 26, 1887.	N. Y.
Edward J. McGlynn, October 18, 1887.	D	.....	Private, Co. A, 32d Regt., Dec. 3, 1883; Corporal, April 25, 1884; First Sergeant, Jan. 14, 1886; Second Lieutenant, April 16, 1886; First Lieutenant, Co. D, Oct. 18, 1887.	N. Y.
Second Lieutenants.				
William Luthy, December 4, 1885.....	H	.....	Private, Co. H, 32d Reg., Aug. 12, 1884; Sergeant, May 19, 1885; Second Lieutenant, Dec. 4, 1885.	N. J.

INFANTRY — THIRTY-SECOND REGIMENT — *(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE. In Armies of the United States.	SERVICE. In the National Guard.	Born.
Second Lieutenants (Continued).				
John Rooney, August 9, 1887	B		Private, Co. A, 32d Regt., Nov. 21, 1885; Quartermaster Sergeant, May 21, 1885; Private, Oct. 22, 1886; transferred to Co. D, Oct. 29, 1886; Corporal, Dec. 8, 1886; Private, June 17, 1887; transferred to Co. B same day; Second Lieutenant, Aug. 9, 1887.	Eng.
George D. Russell, August 12, 1887	C		Private, 49th Regt., May 27, 1867; Corporal, Jan. 22, 1874; discharged June, 1875; Second Lieutenant, Co. C, 32d Regt. Aug. 12, 1887.	Mass.
Alexander Mitzel, Jr., Aug. 12, 1887	G		Second Lieutenant, Co. G, 32d Regt., Aug. 12, 1887.	N. Y.
William Finkelmeier, October 18, 1887	D		Private, 32d Regt., Dec. 1, 1882; Corporal, Aug. 19, 1883; Sergeant, June 23, 1884; First Sergeant, Nov. 27, 1885; Second Lieutenant, Oct. 18, 1887.	N. Y.
John C. McGlynn, December 12, 1887	A		Private, 32d Regt., Dec. 4, 1883; Corporal, Dec. 21, 1885; Quartermaster Sergeant of Regiment, Nov. 26, 1886; Second Lieutenant, Co. A, Dec. 12, 1887.	N. Y.

FORTY-SEVENTH REGIMENT — (Eight Companies).

Second Brigade.

Armory, corner of Fourth and North Second streets, E. D., Brooklyn.

Colonel.				
Edward F. Gaylor, July 2, 1884			Private, Co. G, 47th Regt., Nov. 20, 1871; Corporal Feb. 20, 1873; Sergeant, April 29, 1874; Second Lieutenant, Oct. 14, 1874; First Lieutenant, Dec. 27, 1875; Captain, Aug. 2, 1876; Major, Sept. 28, 1881; Colonel, July 2, 1884.	N. Y.

Lieutenant-Colonel.				
Frederick S. Benson, Nov. 19, 1884	....	Sergeant-Major, 22d Mass. vols., Oct. 8, 1861; Adjutant, June 22, 1862; discharged Aug. 26, 1864; Second Lieutenant, U.S. Sig. Corps, Aug. 27, 1864; discharged Aug. 17, 1865; Brevet Captain, U. S. A., April 20, 1866.	Lieutenant-Colonel, 47th Regt., Nov. 19, 1884	Mass.
Major.				
John G. Eddy, Nov. 19, 1884	....	.....	Private, 47th Regt., Nov. 16, 1875; Second Lieutenant, Oct. 30, 1877; First Lieutenant, Oct. 8, 1878; Adjutant, April 6, 1881; Major, Nov. 19, 1884.	N. Y.
Adjutant — First Lieutenant.				
William H. Hubbell, Dec. 10, 1884	....	.....	Private, Co. I, 47th Regt., April 10, 1865; Sergeant, Jan. 14, 1867; returned to ranks, 1869; Sergeant, March 2, 1869; Left General Guide, June 18, 1870; Right General Guide, Feb. 14, 1871; returned to ranks, Aug. 14, 1871; First Sergeant, Co. K, Feb. 26, 1872; discharged March 13, 1878; First Lieutenant and Adjutant, Dec. 10, 1884.	N. Y.
Quartermaster — First Lieutenant.				
Edward Milner, Jan. 10, 1882	....	.....	Private, Co. F, 47th Regt., Oct. 1, 1875; Corporal, June 12, 1876; Ordnance Sergeant, 47th Regt., April 17 1878; Commissary Sergeant, Dec. 13, 1880; Quartermaster, Jan. 10, 1882.	Eng.
Commissary of Subsistence — First Lieutenant.				
Warren E. Smith, Feb. 18, 1885	....	.....	First Lieutenant and Commissary of Subsistence, 47th Regt., Feb. 18, 1885.	N. Y.
Surgeon — Major.				
Edward Hilborne Ashwin, Apr. 23, 1883	....	Private, Co. C, 8th Indiana vols., June 9, 1862; discharged Sept. 24, 1862; Midshipman, U. S. Navy, July 22, 1863; resigned March 9, 1866.	First Lieutenant and Assistant Surgeon, 47th Regt., June 30, 1880; captain and Surgeon, Nov. 2, 1881 Major and Surgeon, April 23, 1883.	Eng.
Assistant Surgeon — Captain.				
George C. Jeffery, Oct. 29, 1884	....	.....	Captain and Assistant Surgeon, 47th Regt., Oct. 29, 1884.	N. Y.
Chaplain — Captain.				
Newland Maynard, May 26, 1875	....	.....	Chaplain, 47th Regt., May 26, 1875	Conn

INFANTRY — FORTY-SEVENTH REGIMENT — *(Continued).*

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Inspector of Rifle Practice — Captain.				
Alvah G. Brown, Jan. 16, 1876	....	Private, Co. H, 71st N. Y. S. militia, April 21 to July 30, 1861.	Private, Co. H, 71st Regt., April 21 to July 30, 1861; Second Lieutenant, 47th Regt., Feb. 7, 1872; First Lieutenant, Dec. 10, 1875; Captain and Inspector of Rifle Practice, Jan. 16, 1876.	N. Y.
Captains.				
Alfred A. Doughty, May 25, 1869; Brevet Major, Oct. 29, 1877	B	Private, 47th N. G. S. N. Y., May 27 to Sept. 1, 1862; First Sergeant, 47th N. G. S. N. Y., June 17 to July 23, 1863.	Private, 47th Regt., April 2, 1862; First Sergeant, May 30, 1863; Second Lieutenant, Oct. 16, 1863; First Lieutenant, Feb. 2, 1866; Captain, May 25, 1869.	N. Y.
William R. Pettigrew, Sept. 11, 1878	G	.....	Private, Co. C, 47th Regt., Oct. 7, 1865; First Lieut., June 7, '76; Captain, Co. G, Sept. 11, '78.	Scot.
Frank J. LeCount, Jr., Nov. 25, 1881	K	Private, Co. C, 13th N. G. S. N. Y., May 28 to Sept. 5, 1862; Private, 47th N. G. S. N. Y., June 17 to July 23, 1863.	Private, Co. C, 13th Regt., May 28 to Sept. 5, 1862; Private, Co. B, 47th Regt., Oct. 19, 1862; Corporal; Sergeant; honorably discharged Nov. 16, 1869; Second Lieutenant, Co. K, June 14, 1878; First Lieutenant, July 15, 1881; Captain, Nov. 25, 1881.	N. Y.
William H. Eddy, Feb. 4, 1884	I	.....	Private, Co. E, 47th Regt., Nov. 16, 1875; Corporal, May 9, 1876; Sergeant, Jan. 15, 1878; Second Lieutenant, Co. G, Aug. 5, 1879; First Lieut., April 14, 1882; Captain, Co. I, Feb. 4, '84.	N J.
Charles A. Denike, Dec. 21, 1885	F	.....	Private, Co. B, 22d Regt., Oct. 11, 1869; Corporal, July, 1871; transferred to Co. D, 7th Regt., Oct. 14, 1872; Corporal, Nov. 26, 1875; discharged June 30, 1877; Second Lieutenant, Separate Troop E, Nov. 17, 1879; resigned April 17, 1883, Troop E being the 11th Separate Co.; Captain, 11th Separate Co., Nov. 12, 1883; resigned Nov. 21, 1885; Captain, Co. F, 47th Regt., Dec. 21, 1885.	N. Y.

Hewling H. Quick, April 12, 1887.....	E	.....	Private, Co. I, 13th Regt., Dec. 1, 1880; Sergeant, Sept. 1, 1882; returned to ranks and transferred to Co. F, 13th Regt., Jan. 5, 1883; Sergeant, Feb. 1, 1883; First Lieutenant, 47th Regt., June 9, 1885; Captain, April 12, 1887.	N. J.
John B. Christoffel, Jr., May 6, 1887...	D	....	Private, Co. H, 47th Regt., June 25, 1878; Left General Guide, May 25, 1881; Right General Guide, Dec. 8, 1881; Ordnance Sergeant, Feb. 8, 1882; Commissary Sergeant, Feb. 27, 1884; Second Lieutenant, Co, F, Aug. 18, 1884; First Lieutenant, Dec. 21, 1885; Captain, May 6, '87.	N. Y.
First Lieutenants.				
Charles H. McIlvaine, March 23, 1885.	B	.....	Private, 47th Regt., Jan. 27, 1879; Second Lieutenant, Aug. 1, 1881: First Lieutenant, March 23, 1885.	Penn
Joseph B. Davis, April 29, 1885.....	A	....	Private, Co. A, 47th Regt., Aug. 5, 1878; Corporal, Nov. 6, 1879; Sergeant, May 13, 1880; First Sergeant, Feb. 19, 1883; First Lieutenant, April 29, 1885.	N. Y.
Francis J. Veritzan, May 27, 1885	G	.....	Private, Co. G, 47th Regt., Sept. 17, 1878; Corporal, May 15, 1879; Sergeant, Sept. 18, 1879; First Sergeant, Nov. 17, 1881; First Lieutenant, May 27, 1885.	N. Y.
Wm. Clarke Roe. June 11, 1886.....	E	....	Private, Co. D, 7th Regt., Oct. 31, 1884; First Lieutenant, Co. D, 47th Regt., June 11, 1886; transferred to Co. E, June 14, 1887.	N. Y.
R. George Williams, April 1, 1887.....	K	.....	Private, 47th Regt., Nov. 17, 1865; Corporal, 1867; Sergeant, Sept., 1869; First Sergeant; Second Lieutenant, May 2, 1876; resigned Oct. 25, 1877; First Lieutenant, Co. K, April 1, 1887.	Eng.
J. Wilton Barlow, May 17, 1887.....	I	.....	Private, Co. B, 7th Battalion, N. G. N. J., for two years; Private, Co. A, 47th Regt., May 20, 1885; Second Lieutenant, Co. I, Jan 5, 1886; First Lieutenant, May 17, 1887.	Ohio
Emile F. Christoffel, June 27, 1887....	D	.....	Private, Co. F, 47th Regt., Jan. 17, 1881; Corporal, Oct. 10, 1881; Sergeant, Nov. 19, 1883; First Sergeant, July 2, 1884; Second Lieutenant, March 31, 1886; resigned April 6, 1887; First Lieutenant, Co. D, June 27, 1887.	N. Y.

INFANTRY — FORTY-SEVENTH REGIMENT — *(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
First Lieutenants (Continued).				
Charles L. Spier, Oct. 10, 1887	F		Private, Co. D, 23d Regt., May 4, 1883; Second Lieutenant, Co. E, 13th Regt., June 18, 1885; transferred to Co. A, Oct. 15, 1886; resigned Feb. 16, 1887; First Lieutenant, 47th Regt., Oct. 10, 1887.	N. J.
Second-Lieutenants.				
Eugene E. Bishop, Oct. 27, 1886	B		Private, 23d Regt., Nov. 8, 1870; discharged March 6, 1882; Second Lieutenant, 47th Regt., Oct. 27, 1886.	N. Y.
A. Polhemus Cobb, April 1, 1887	K		Private, 17th Separate Co., Dec. 17, 1883; Corporal, Feb. 21, 1885; Second Lieutenant, Co. K, 47th Regt., April 1, 1887.	N. Y.
Alfred C. Harrison, Jr., Aug. 9, 1887	I		Private, Co. I, 47th Regt., Feb. 2, 1882; Corporal, May 20, 1882; Sergeant, April 7, 1884; First Sergeant, July 29, 1885; Second Lieutenant, Aug. 9, 1887.	N. Y.
Homer L. Bartlett, Aug. 24, 1887	D			

SIXTY-FIFTH REGIMENT (Eight Companies).

Fourth Brigade.

Armory at State Arsenal on Broadway, Buffalo.

Colonel.				
Samuel M. Welch, Jr., Aug. 1, 1887			First Lieutenant, Co. I, 65th Regt., May 26, 1879; Captain, June 30, 1879; Major, Feb. 22, 1882; Lieutenant-Colonel, Nov. 1, 1883; Colonel, Aug. 1, 1887.	N. Y.

Lieutenant-Colonel.				
John E. Robie, Sept. 15, 1887			Private, 74th Regt., July 10, 1864: discharged July 10, 1871; First Lieutenant, Co. G, 65th Regt., Nov. 3, 1880; Captain, Co. H, 65th Regt., Feb. 3, 1881; Major, 65th Regt., Nov. 1, 1883; Lieutenant-Colonel, Sept. 15, 1887.	N. Y.
Major.				
William T. Parsons, Oct. 27, 1887			Second Lieutenant, Co. F, 65th Regt., June 25, 1879; Captain, Jan. 7, 1880; Major, Oct. 27, 1887.	N. Y.
Adjutant—First Lieutenant.				
William H. Chapin, Mar. 22, 1886			First Lieutenant, 65th Regt., Mar. 22, 1880; Adjutant, 74th Regt., Nov. 5, 1881; Major, Aug. 13, 1883; resigned May 8, 1884; First Lieutenant and Adjutant, 65th Regt., Mar. 22, 1886.	N. Y.
Quartermaster—First Lieutenant.				
.....	.....	.....	.....	.....
Commissary of Subsistence—First Lieutenant.				
Oren G. Nichols, Dec. 7, 1882			Private, Co. F, 65th Regt., May 21, 1881; Second Lieut., Oct. 21, 1881; First Lieut., June 6, 1882; Commissary of Subsistence, Dec. 7, 1882.	N. Y.
Surgeon—Major.				
Albert H. Briggs, April 23, 1883			Assistant Surgeon, Oct, 27, 1879; Captain and Surgeon, June 7, 1881; Major and Surgeon, April 23, 1883.	N. Y.
Assistant Surgeon—Captain.				
Floyd S. Crego, Oct. 25, 1887			Captain and Assistant Surgeon, 65th Regt., Oct. 25, 1887.	N. Y.
Chaplain—Captain.				
John W. Brown, Aug. 25, 1886			Chaplain, 65th Regt., Aug. 25, 1886.	Md.
Inspector of Rifle Practice—Captain.				
George J. Metzger, Nov. 1, 1887			Quartermaster, 65th Regt., Dec. 7, 1882; Captain and Inspector of Rifle Practice, Nov. 1, '87.	N. Y.
Captains.				
Angelo C. Lewis, July 3, 1882	I	Landsman, U. S. N., Jan. 30, 1864; disch'ged Jan. 31, 1867.	Captain, 65th Regt., July 3, 1882	Vt.
Robert H. Montgomery, Jan. 31, 1883	G		Private, Co. I, 65th Regt., Oct. 28, 1879; Right General Guide, 65th Regt., Dec. 10, 1879; Color Bearer, July 27, 1881; Commissary Sergeant, Sept. 27, 1882; Second Lieutenant, Co. A, Oct. 10, 1882; Captain, Co. G, Jan. 31, 1883.	N. Y.

INFANTRY — SIXTY-FIFTH REGIMENT — (*Continued*).

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Captains (Continued).				
George H. Howard, Sept. 17, 1883.....	C	Private, Co. M, 8th N. Y. vol. artillery, Jan. 25, 1864; Corporal, May 30, 1864; transferred to First Battalion, V. R. C., March 10. 1865; honorably discharged Nov. 15, 1865.	Second Lieutenant, Co. C, Aug. 7, 1882; Captain, Sept. 17, 1883.	N. Y.
Otto F. Langenbach, Nov. 13, 1883....	H	.....	Second Lieutenant, Co. H, 65th Regt., Jan. 13, 1880; First Lieutenant, Dec. 22, 1881; Captain, Nov. 13, 1883.	Ohio
John H. Swanson, Nov. 9, 1885.....	D	.....	Private, Fourth (now Thirteenth) Separate Co., April 5, 1877; Second Lieutenant, Nov. 9, 1880; Second Lieutenant, 65th Regt., Nov. 18, 1884; Captain, Co. D, Nov. 9, 1885.	Sweden.
George J. Haffa, March 22, 1887.....	A	.....	Captain, Co. A, 65th Regt., March 22, 1887....	N. Y.
Allison K. Hume, Oct. 10, 1887.....	B	.....	Private, Co. F, 65th Regt., June 23, 1881; Sergeant, Jan. 25, 1882; Right General Guide, May 3, 1883; returned to ranks Dec. 19, 1863; Second Lieutenant, Co. B, March 14, 1885; resigned Dec. 2, 1886; Captain, Co. B, Oct. 10, 1887.	.....
Charles E. P. Babcock, Nov. 21, 1887..	F	.....	Private, Co. F, 65th Regt., Oct. 4, 1882; Sergeant, Feb. 7, 1883; First Sergeant, April 28, 1885; First Lieutenant, March 15, 1886; Captain, Nov. 21, 1887.	N. Y.
First Lieutenants,				
Philip Fogarty, Nov. 18, 1884.....	H	.....	Second Lieutenant, Nov. 13, 1883; First Lieutenant, Nov. 18, 1884.	.....
John Ratcliffe, Aug. 24, 1886.....	D	.....	Second Lieutenant, Co. D, 65th Regt., May 11, 1886; First Lieutenant, Aug. 24, 1886.	N. Y.

Walter F. Nurzey, March 10, 1887	C		Private, Co. C, 74th Regt., March 2, 1877; Sergeant, May 4, 1878; First Sergeant, July 12, 1878; Second Lieutenant, Aug. 15, 1879; First Lieutenant. Jan. 30, 1880; resigned, Jan. 12, 1882; Second Lieutenant, Co. C, 65th Regt., April 12, 1886; First Lieutenant, Mar. 10, 1887.	Eng.
Albert J. Myer, Nov. 15, 1887	A			.....
Edward A. Hall, Dec. 5, 1887	F		Second Lieutenant, Co. F, 65th Regt., March 15, 1886; First Lieutenant, Dec. 5, 1887.	N. Y.
Second Lieutenants.				
Henry W. Brendel, Sept. 15, 1884	I		Private, 74th Regt., April 1, 1878; transferred to Co. I, 65th Regt., Jan. 17, 1882; Sergeant, June 14, 1884; Second Lieutenant, Sept. 15, 1884.	.....
Lewis G. Northrup, Oct., 5 1886	D		Private, Co. F, 74th Regt., Dec. 20, 1881; Corporal Oct. 30, 1883; Second Lieutenant, 65th Regt., Oct. 5, 1886.	N. Y.
John B. Rawson, Jr., April 5, 1887	G		Second Lieutenant, Co. G, 65th Regt., April 5, 1887.	N. Y.

SIXTY-NINTH REGIMENT — (Ten Companies).

First Brigade.

Armory, Tompkins Market, New York city.

Colonel.				
James Cavanagh, Nov. 29, 1867	....	Captain, 69th N. Y. S. militia May 9, 1861, to Aug. 3, 1861; Major, 69th N. Y. vols. Nov. 2, 1861; discharged May 16, 1862, for disability; in 69th N. G. S. N. Y. from June 25 to July 25, 1863; and as Lieutenant-Colonel, 69th N. G. S. N. Y., from July 6 to Oct. 6, 1864.	Private, Co. E, 69th N. Y. S. militia, fall, 1852; First Lieutenant, March 9, 1857; Captain, Jan. 13, 1859; in volunteer service from Nov. 2, 1861; Lieutenant-Colonel, 69th N. G. S. N. Y., Aug. 10, 1863; Colonel, Nov. 29, 1867.	Ire.

INFANTRY — SIXTY-NINTH REGIMENT — *(Continued).*

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Lieutenant-Colonel.				
William De Lacy, Aug. 9, 1877; Brevet Brigadier-General, June 2, 1869	....	First Lieutenant, 37th N. Y. vols., July 8, 1861: Captain, Sept. 10, 1861; Major, Oct. 8, 1862; honorably discharged June 22, 1863; Lieutenant-Colonel, 164th N. Y. vols., Oct. 19, 1863; Colonel, June 13, 1864; honorably discharged, July 15, 1865; Brevet Brigadier-General, U. S. vols., March 13, 1865.	Colonel, 4th Regt., March 10, 1869; Supernumerary, March 10, 1870; Lieutenant-Colonel, 69th Regt., Aug. 9, 1877.	Eng.
Major.				
Edward Duffy, March 16, 1876	....	.....	Private, Co. G, 69th Regt., June 3, 1867; First Lieutenant, March 14, 1871; Major, Feb. 13, 1875; honorably discharged Feb. 7, 1876; Major, March 16, 1876.	Ire.
Adjutant — First Lieutenant.				
James Moran, Nov. 12, 1875	....	....	Private, Co. F, 69th Regt., Nov. 5, 1869; Second Lieutenant, May 3, 1875; Adjutant, Nov. 12; 1875.	Ire.
Quartermaster — First Lieutenant.				
James Joseph Ward, Sept. 5, 1882	....	....	Second Lieutenant, Co. G, 69th Regt., Aug. 9, 1877; Quartermaster, 69th Regt., Sept. 5, 1882.	Ire.
Commissary of Subsistence — First Lieutenant.				
Robert E. Ford, May 1, 1887	....	.....	Private, Co. F, 69th Regt., April, 1886; First Lieutenant and Commissary of Subsistence, May 1, 1887.	Conn
Surgeon — Major.				
A. William Ford, April 8, 1884	....	.....	Assistant Surgeon, 69th Regt., Aug. 29, 1882; Major and Surgeon, April 8, 1884.	U. S.

Assistant Surgeon — Captain.				
John J. Cosgrove, March 1, 1885	....	.....	.....	.....
Chaplain — Captain..				
Matthew P. Breen, Sept. 15, 1877	....	.....	Captain and Chaplain, 69th Regt., Sept. 15, 1877.	Ire.
Inspector of Rifle Practice — Captain.				
John J. Ryan, May 2, 1887	....	.....	Commissary of Subsistence, 69th Regt., Aug. 1, 1885; Captain and Inspector of Rifle Practice, May 2, 1887.	.....
Captains.				
Michael Bennan, May 10, 1865	A	Sergeant, Co. A, 69th N. Y. S. militia, from May 9 to Aug. 3, 1861.	Private, Co. A, 69th Regt., July 6, 1857; Sergeant, April 18, 1860; Captain, May 10, 1865.	Ire.
John Kerr, January 29, 1869; Brevet Major, March 18, 1876	K	Private, Co. B, 69th N. Y. S. militia, from May 9, 1861; captured, July 21, 1861; mustered out, May 15, 1862; First Sergeant from June 25 to July 25, 1863; Second Lieutenant from July 6 to Oct. 6, 1864.	Private, Co. B. 69th Regt., April 19, 1861; Sergeant, Nov. 12, 1862; First Sergeant, June 27, 1863; Second Lieutenant, April 17, 1864; Captain, Co. K, Jan. 29, 1869.	Ire.
Hugh Coleman, January 4, 1875	E	Private, Co. A, 5th Ohio vols., in 1862; Band leader; honorably discharged, 1862.	Second Lieutenant, Co. E, 69th Regt., Oct. 13, 1873; Captain, Jan. 4, 1875.	Mass
Stephen P. Ryan, August 9, 1877	G	.....	Private, Co. G, 69th Regt., Dec. 1, 1870; Corporal, May 2, 1872; Sergeant, Sept. 3, 1874; Second Lieutenant, Dec. 3, 1874; Captain, August 9, 1877.	Ire.
James G. Cunningham, Dec 6, 1880	I	.....	Private, Co. D, 69th Regt., June 4, 1873; Corporal, Aug. 6, 1875; Sergeant, Dec. 14, 1875; Ordnance Sergeant, 69th Regt., Oct. 8, 1877; Second Lieutenant, March 11, 1880; Captain. Dec. 6, 1880.	Ire.

INFANTRY — SIXTY-NINTH REGIMENT — *(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Captains — (Continued).				
James Conlon, December 27, 1881.....	B	....	Private, Co. D, 69th Regt., Sept. 3, 1866; Corporal, Oct. 1, 1866; Sergeant, Aug. 3, 1868; First Sergeant, Dec. 8, 1870; transferred to Company H, Jan. 15, 1874; First Sergeant, Feb. 17, 1874; First Lieutenant, Company B, May 7, 1877; Captain, Dec. 27, 1881.	Ire.
Denis C. McCarthy, Nov. 1, 1883.....	C	.....	Private, Co. C, 69th Regt., Sept. 8, 1866; Corporal, May 6, 1868; Sergeant, June 2, 1869; Second Lieutenant, March 18, 1870; honorably discharged, Dec. 27, 1873; First Sergeant, Nov. 30, 1874; Second Lieutenant, Feb. 2, 1880; Captain, Nov. 1, 1883.	Ire.
Thomas Mortimer, March 23, 1885....	F	.....	Private, Co. F, 69th Regt., Sept. 3, 1880; Sergeant, Sept. 1, 1883; Second Lieutenant, Dec. 19, 1883; Captain, March 23, 1885.	Ire.
Maurice Cox, April 27, 1885	D	.....	Private, Co. D, 69th Regt., April 2, 1872; Sergeant, Jan. 5, 1875; First Sergeant, Sept. 2, 1876; First Lieutenant, Feb. 21, 1882; Captain, April 27, 1885.	Ire.
Patrick J. Morgan, Oct. 26, 1866	H	.....	Private, Co. D, 69th Regt., Jan. 4, 1876; Corporal, Sept. 29, 1879; Sergeant, April 1, 1880; Quartermaster Sergeant, May 18, 1882; First Lieutenant, Co. H, Nov. 8, 1883; Captain, Oct. 26, 1886.	.....
First Lieutenants.				
John E. O'Brien, December 6, 1880...	E	Private, Co. H, 69th Regt., May 26, 1862, for three months; mustered out Sept. 3, 1862.	Private, Co. H, 69th Regt., May 26, 1862, to Sept. 3, 1862; Second Lieutenant, 95th Regt., N. G. S. N. Y., Nov. 9, 1863; disbanded, 1866; Private, 69th Regt., June 22, 1875; First Lieutenant, Co. E, Dec. 6, 1880.	Ire.

James Mahoney, December 6, 1881	I	.....	Private, Co. I, 69th Regt., Feb. 10, 1880; Corporal, April 6, 1880; Sergeant, May 4, 1880; Second Lieutenant, Feb. 18, 1881; First Lieutenant, Dec. 6, 1881.	Conn
Paul F. Leonard, April 11, 1883	B	.....	Private, 69th Regt., May 14, 1879; Commissary Sergeant, Nov. 17, 1881; Second Lieutenant, Co. B, April 11, 1883.	N. Y.
William Hogan, February 7, 1884	G	.....	Private, Co. G, 69th Regt., Dec. 19, 1867; Sergeant, May 13, 1875; First Sergeant, Nov. 6, 1877; Second Lieutenant, Feb. 1, 1883; First Lieutenant, Feb. 7, 1884.	Ire.
John B. Woods, September 1, 1884	K	.....	Private, Co. K, 69th Regt., June 25, 1883; Sergeant, July 10, 1884; First Lieutenant, Sept. 1, 1884.	Ire.
John Murphy, December 29, 1884	C	Private, Co. K, 69th Regt. N. G. S. N. Y., June 25 to July 25, 1863; Private, Co. A, 69th N. Y. vols., March 1, 1864; discharged, Nov. 4, 1864.	Private, Co. K, 69th Regt., June 25 to July 25, 1863; Private, Co. C, 69th Regt., Aug. 16, 1880; Sergeant, March 22, 1882; Second Lieutenant, Dec. 31, 1883; First Lieutenant, Dec. 29, 1884.	Ire.
William Desmond, June 16, 1885	D	.....	Private, Co. D, 69th Regt., April 2, 1872: Sergeant, Dec. 10, 1875; Quartermaster Sergeant, Jan. 13, 1879; discharged, July 8, 1884, First Lieutenant, Co. D, 69th Regt., June 16, 1885.	N. Y.
Peter Carroll, March 29, 1886	F	.....	Private, 69th Regt., Sept. 7, 1880; Left General Guide, 1884; Commissary Sergeant, 1884; Second Lieutenant, Co. F, 69th Regt., June 16, 1885; First Lieutenant, March 29, 1886.	Ire.
John McCauley, May 17, 1887	A	.....	Private, Co. A, 69th Regt., Nov. 9, 1881; Quartermaster Sergeant, Dec. 11, 1882; discharged, Feb. 21, 1887; First Lieutenant, May 17, 1887.	Ire.
Second Lieutenants.				
Patrick Farrelly, June 25, 1877	D	.....	Private, Co. D. 69th Regt., Dec. 16, 1875; Corporal, March 1, 1877; Second Lieutenant, June 25, 1877.	Ire.
James B. Manahan, May 24, 1880	E	.....	Private, Co. E. 69th Regt., Dec. 8, 1879; Second Lieutenant, May 24, 1880.	N.Y.

INFANTRY — SIXTY-NINTH REGIMENT — *(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Second Lieutenants — (Continued).				
Luke C. Quinn, May 18, 1882	I		Private, Co. I, 69th Regt., Jan. 4, 1879; Sergeant, Jan. 6, 1880; First Sergeant, June 14, 1882; Second Lieutenant, May 18, 1882.	N. Y.
Edward T. McCrystal, June 16, 1884	K		Private, Co. I, 69th Regt., March 25, 1881; Corporal, Sept. 20, 1881; Sergeant, Aug. 13, 1883; Second Lieutenant, Co. K, June 16, 1884.	Ire.
Patrick J. Moriarty, Dec. 15, 1884	B		Private, Co. B, 69th Regt., April 1, 1879; Sergeant, March 22, 1882; Second Lieutenant, Co. B, Dec. 15, 1884.	Ire.
John O'Connell, December 29, 1884	C	Private, Co. A, 69th N. Y. vols., Sept. 27, 1861; re-enlisted in the field, Quartermaster Sergeant, 69th vols., Jan., 1864; discharged June 30, 1865.	Private, Co. C, 69th Regt., Sept. 1, 1879; Quartermaster Sergeant, Sept. 11, 1879; First Sergeant, Dec. 6, 1880; Second Lieutenant, Dec. 29, 1884.	Ire.
William McLaughlin, Jan. 12, 1885	H		Private, Co. H, 69th Regt., 1875; Corporal, Sept. 7, 1876; Sergeant, Nov. 6, 1879; discharged March 29, 1882; re-enlisted, June 12, 1882, for one year; re-enlisted, June 23, 1884; Second Lieutenant, Jan. 12, 1885.	Ire.
John J. Scanlon, Dec. 28, 1886	F		Private, 69th Regt., April 20, 1883; Sergeant, July 3, 1885; Second Lieutenant, Dec. 28, 1886.	Ire.
Francis J. Magee, May 26, 1887	G		Private, Co. G, 69th Regt., Feb. 6, 1882; Sergeant, Dec. 3, 1885; Second Lieutenant, May 26, 1887.	Ire.

SEVENTY-FIRST REGIMENT— (Nine Companies).

First Brigade.

Armory, corner of Broadway and Thirty-sixth street, New York city.

Colonel.				
Frederick Kopper, July 19, 1887	....	Private, Co. D, 7th N. Y. S. militia, from June 17 to July 21, 1863.	Private, Co. D, 7th Regt., June 16, 1863; Corporal, Dec, 30, 1869; Sergeant, March 15, 1872; First Sergeant, Jan. 31, 1879; First Lieutenant, March 5, 1883; discharged Oct. 4, 1884; First Lieutenant and Adjutant, 71st Regt., Oct. 4, 1884; Major, Dec. 17, 1884; Lieutenant-Colonel, Feb. 26, 1887; Colonel, July 19, 1887.	Scot.
Lieutenant-Colonel.				
James A. Dennison, Sept. 15, 1887	....	In 15th Mo. vols., U. S. Reserve Corps, from Sept., 1861, to Jan., 1862; Private, Co. E, 8th Mo. S. Mil. Cav., from April 13, 1862, to April 12, 1865; Cadet, U. S. A., Sept., 1866; Second Lieutenant, 2d U. S. artillery, June 15, 1870; Second Lieutenant, 8th U. S. cav., from Oct., 1871, to Aug., 1872; Major of Engineers, Egyptian Army, from Jan. 1, 1875, to Jan. 1, 1877.	Lieutenant-Colonel, 76th Regt., Sept. 15, 1887.	Ind.
Major.				
Wallace A. Downs, April 19, 1887	....	.....	Adjutant, 16th Battalion, Dec. 28, 1874; Major, Aug. 8, 1876; discharged April 28, 1880; Adjutant, 71st Regt., Sept. 28, 1886; Major, April 19, 1887.	N. Y.
First Lieutenant and Adjutant.				
Philip S. Tilden, March 10, 1887	....	.....	Private, Co. H, 71st Regt., April 26, 1880; Corporal, Feb. 7, 1882; transferred to Co. I, May 7, 1882; Sergeant, April 29, 1883; Second Lieutenant, 71st Regt., July 21, 1884; First Lieutenant, Jan. 7, 1885; discharged Sept. 16, 1885; First Lieutenant, Co. B, 71st Regt., March 10, 1887; Adjutant, with original rank, Oct. 19, 1887.	N. J.

INFANTRY — SEVENTY-FIRST REGIMENT — *(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
First Lieutenant and Quartermaster.				
William E. D. Stokes, August 1, 1887,	....	.....	First Lieutenant and Quartermaster, 71st Regt., Aug. 1, 1887.	N. Y.
Commissary of Subsistence—First Lieutenant.				
Edgar S. Auchincloss, August 1, 1887,	....	.....	First Lieutenant and Commissary Subsistence, Aug. 1, 1887.	N. Y.
Surgeon — Major.				
Edward T. T. Marsh, March 4, 1885...	....	Assistant Acting Surgeon, U. S. navy, Feb. 5, 1864; discharged, March 29, 1868.	Surgeon, 71st Regt., March 4, 1885.	N. Y.
Assistant Surgeon — Captain.				
William R. Pryor, Oct. 1. 1887	....	.....	Captain and Assistant Surgeon, 71st Regt., October 1, 1887.	Va.
Inspector of Rifle Practice—Captain.				
Charles H. Hoyt, August 1, 1887	....	.....	Private, Co. I, 7th Regt., May 9, 1882; Captain and I. R. P., 71st Regt., Aug. 1, 1887.	Mass
Captains.				
William C. Clark, Nov. 14, 1865; Brevet Major, June 28, 1877.....	D	Served with 79th militia, also known as 79th N. Y. vols., in war of rebellion for three years, May, 1861, to May, 1864.	Private, 79th Regt., militia, Jan. 13, 1859; Corporal, ; Sergeant, May 13, 1861; Second Lieutenant, Co. G, May 16, 1862; First Lieutenant, Co. F, Sept. 23. 1862; Captain, Co. I, April 15, 1863; honorably discharged, May 31, 1864; Captain, Co. E, Nov. 14, 1865; Supernumerary, Dec. 18, 1875; on duty as Captain, 71st Regt., since Jan. 31, 1876.	Scot.

L. Frank Barry, January 7, 1885.....	I	With 71st N. G. S. N. Y. in U. S. service for 30 days, July, 1863.	Private, Co. I, 71st Regt., Feb. 4, 1863; Corporal, May 13, 1865; honorably discharged, April 15, 1872; Second Lieutenant, March 13, 1882; First Lieutenant, July 21, 1884; Captain, Jan. 7, 1885.	N. Y.
Wright D. Goss, April 30, 1885.....	K	.....	Private, Co. K, 71st Regt., Jan. 21, 1880; Corporal, Feb. 1, 1882; Second Lieutenant, Nov. 22, 1882; First Lieutenant, Oct. 19, 1883; Captain, April 30, 1885.	Ohio.
Alfred P. Delcambre, October 6, 1885.	H	.....	Co. C, 2d Conn. N. G., from 1868 to 1872; Private, 8th Regt., May 7, 1879; Second Lieutenant, Aug. 16, 1882; discharged, May 29, 1885; First Lieutenant, 71st Regt., June 16, 1885; Captain, Co. H, Oct. 6, 1885.	Ire.
Augustus T. Francis, March 19, 1886.	C	Corporal, Co. C, 71st Regt., April 19, to July 30, 1861; First Sergeant, from May 28 to Sept. 2, 1862.	Private, Co. C, 71st Regt., March, 1861; Corporal, April, 1861; First Sergeant, May, 1862; First Lieutenant, June, 1864; Adjutant, Dec., 1866; resigned, Aug. 5, 1871; First Lieutenant and Adjutant, 71st Regt., March 4, 1885; Captain, Co. C, March 19, 1886.	.....
Charles M. Kennedy, April 13, 1886...	A	.....	Private, 71st Regt., Sept. 15, 1884; Color bearer, Sept. 15, 1884; First Lieutenant, Co. F, Dec. 10, 1884; Captain, Co. A, April 13, 1886.	N. J.
Abel W. Belknap, January 21, 1887...	B	.....	Private, 71st Regt., Sept. 21, 1870; Corporal, Nov. 8, 1870; Sergeant, Dec. 8, 1870; Second Lieutenant, Feb. 9, 1872; First Lieutenant, May 3, 1873; Captain, Nov. 6, 1873; Brevet Major, Nov. 6, 1873; rendered supernumerary, Dec. 19, 1884; Captain, 71st Regt., Jan. 21, 1887.	N. Y.
James E. Place, February 15, 1887....	G	.....	Private, Co. H, 71st Regt., April 26, 1880; Corporal, July 13, 1880; Sergeant, Feb. 7, 1882; First Sergeant, Feb. 6, 1883; Second Lieutenant, Co. G, May 15, 1883; First Lieutenant, June 23, 1886; Captain, Feb. 15, 1887.	N. Y.
John A. H. Dressel, March 30, 1887....	F	.....	Private, Co. D, 22d Regt., Feb. 27, 1877; Quartermaster Sergeant, Oct. 27, 1879; discharged, Dec. 18, 1882; Private, Co. H, 13th Regt., Feb. 18, 1885; discharged, March 26, 1886: Second Lieutenant, Co. K, 71st Regt., May 19, 1886; Captain, Co. F, March 30, 1887.	N. Y.

INFANTRY — SEVENTY-FIRST REGIMENT — *(Continued)*.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
First Lieutenants.				
David H. Teets, April 16, 1885.....	D	.....	Private, Co. B, 71st Regt., Dec. 9, 1873; Sergeant, June 26, 1876; Second Lieutenant, July 9, 1878; First Lieutenant, April 16, 1885.	N. Y.
Alfred Jefferson, January 5, 1886.....	H	.....	Private, Co. K, 71st Regt., Dec. 5, 1877; Corporal, April 7, 1880; Second Lieutenant, 8th Regt., Sept. 14, 1882; Captain, Co. C, Jan. 28, 1884; resigned Dec. 2, 1885; First Lieutenant, Co. H, 71st Regt., Jan. 5, 1886.	N. Y.
William W. Chilton, January 20, 1886,	K	.....	Private, Co. H, 37th Regt., Nov. 8, 1866; discharged Jan. 25, 1875; Private, Co. K, 71st Regt., April 24, 1885; Corporal, June 3, 1885; First Lieutenant, Jan. 20, 1886.	N. Y.
Paul V. Harris, March 19, 1886.....	F	.....	Private, Co. A, 71st Regt., May 31, 1881; Corporal, Jan. 24, 1882; Sergeant, Aug. 21, 1882; Quartermaster Sergeant of Regt., Feb. 8, 1884; First Lieutenant, Co. B, March 19, 1886; transferred to Co. F, March 19, 1887.	Ky.
Edward C. O'Brien, December 7, 1886,	A	.....	Private, Co. A, 71st Regt., January, 1884; First Lieutenant, 71st Regt., Dec. 7, 1886.	N. Y.
Maurice D. Quiry, March 2, 1887.....	I	.....	Private, Co. I, 71st Regt., April 5, 1880; Corporal, Sept. 4, 1884; Second Lieutenant, Feb. 9, 1885; First Lieutenant, March 2, 1887.	Ire.
William Brooke, April 8, 1887.....	C	.....	Private, 6th Regt., N. G. Pa., July 15, 1882, to Sept. 1, 1885; Private, 4th Regt., N. G. N. J., Sept. 1, 1885, to Feb. 10, 1886; Private, 7th Regt., N. G. S. N. Y., Jan. 10, 1887, to April 8, 1887; First Lieutenant, Co. C, 71st Regt., April 8, 1887.	Pa.

Clinton H. Smith, October 18, 1887....	B	.....	Private, Co. B, 7th Regt., June, 1881; Second Lieutenant, Co. B, 71st Regt., March 10, 1887; First Lieutenant, Oct. 18, 1887.	N. Y.
Second Lieutenants.				
Edward J. Little, May 3, 1883.....	H	.....	Private, Co. A, 17th Battalion (5th Separate Company), Feb. 22, 1879; Second Lieutenant, 5th Separate Co., May 3, 1883; Second Lieutenant, Co. H, 71st Regt., with original rank, October 20, 1887.	N. Y.
Charles B. Stone, November 18, 1886..	D	.....	Second Lieutenant, Co. D, 71st Regt., Nov. 18, 1886.	La.
Emile R. Bangs, November 22, 1886..	G	.....	Private, Co. H, 71st Regt., Nov. 22, 1881; Second Lieutenant, 71st Regt., Nov. 22, 1886.	Ger.
William T. Gouch, March 1, 1887.....	A	.....	Private, 16th Battalion, March 7, 1879; Corporal, Nov. 3, 1882; Sergeant, 4th Separate Co., March 7, 1884; Second Lieutenant, 71st Regt., March 1, 1887.	N. Y.
Clarence M. Davis, May 17, 1887.....	I	.....	Private, Co. I, 71st Regt., Feb. 11, 1885; Corporal, June 29, 1885; First Sergeant, March 5, 1886; Second Lieutenant, May 17, 1887.	N. Y.
Henry Deike, May 27, 1887.....	K	.....	Private, Co. K, 71st Regt., Feb. 11, 1885; Corporal, May 5, 1886; Sergeant, Sept. 14, 1886; Second Lieutenant, May 27, 1887.	N. Y.
James H. Southworth, June 1, 1887...	F	.....	Private, Co. F, 71st Regt., March 5, 1879; Sergeant, 1883; First Sergeant, September, 1864; Second Lieutenant, June 1, 1887.	N. Y.
John Noble Golding, October 14, 1887,	C	.....	Private, 71st Regt., Oct. 5, 1881; Left General Guide, Nov. 20, 1882; Right General Guide, March, 1883; returned to Company, Mar. 24, 1884; Corporal, Nov. 7, 1884; Sergeant Standard Bearer, March 10, 1885; discharged Oct. 30, 1886; Second Lieutenant, Co. C, Oct. 14, 1887.	N. Y.

INFANTRY — (*Continued*).

SEVENTY-FOURTH REGIMENT — (Seven Companies).

Fourth Brigade.

Armory at Virginia street and Tremont place, Buffalo.

NAME, GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
Colonel. William M. Bloomer, April 10, 1883	....	....	Private, Co. B, 74th Regt., Aug. 22, 1871; Sergeant, June 5, 1872; First Lieutenant, June 25, 1877; Captain, March 31, 1879; Colonel, 74th Regt., April 10, 1883.	N. Y.
Lieutenant-Colonel. Usual S. Johnson, May 14, 1883	....	....	Major, 74th Regt., Oct. 6, 1880; Lieutenant-Colonel, May 14, 1883.	N. Y.
Major. George A. Davis, Jan. 4, 1886	....	....	Private, Co. D, 74th Regt., Aug. 25, 1875; Quartermaster Sergeant, Second Lieutenant, July 17, 1876; First Lieutenant March 16, 1877; Captain, Feb. 18, 1878; discharged, Dec. 11, 1880; Major, Jan. 4, 1886.	N. Y.
Adjutant — First Lieutenant. John C. White, October 8, 1883	....	....	Captain, 65th Regt., May 29, 1883; resigned, Oct. 8, 1883, First Lieutenant and Adjutant, 74th Regt., Oct. 8, 1883.	N. Y.
Quartermaster — First Lieutenant. Henry R. Clark, August 5, 1882	....	....	First Lieutenant and Commissary of Subsistence, 74th Regt., Aug. 5, 1882; appointed Quartermaster, April 23, 1883, with former rank, Aug. 5, 1882.	N. Y.
Commissary of Subsistence — First Lieutenant. Willis R. Buck, October 11, 1886	....	....	First Lieutenant and Commissary of Subsistence, 74th Regt., Oct. 11, 1886.	N. Y.

Surgeon — Major.				
Charles G. Stockton, April 23, 1883	...	.....	First Lieutenant and Assistant Surgeon, Nov. 12, 1881; Major and Surgeon, April 23, 1883.	Ohio.
Assistant Surgeon — Captain.				
George W. York, May 21, 1884	...	.....	First Lieutenant and Assistant Surgeon, April 23, 1883; Captain and Assistant Surgeon, May 21, 1884.	Can.
Chaplain — Captain.				
Walter North, January 10, 1880	...	.....	Chaplain, Jan. 10, 1880	Penn
Inspector of Rifle Practice — Captain.				
William Franklin, April 23, 1883	...	.....	Private, Co. B, 74th Regt., May 14, 1881; Second Lieutenant, Sept. 1, 1881; Captain and Inspector of Rifle Practice, April 23, 1883.	Eng.
Captains.				
Charles Lee Abel, Oct. 3, 1881	C	.....	Captain, Oct. 3, 1881.	N. Y.
George C. Fox, May 9, 1882	F	.....	Second Lieutenant, 65th Regt., Nov. 18, 1879; First Lieutenant, July 6, 1881; Captain, 74th Regt., May 9, 1882.	N. Y.
Peter Paulus, Nov. 27, 1882	G	.....	Private, Co. G, 74th Regt., Jan. 5, 1876; Sergeant, Jan. 30, 1878; First Sergeant, Sept. 27, 1880; First Lieutenant, May 16, 1881; Captain, Nov. 27, 1882.	N. Y.
Frank T. Bloomer, April 27, 1883	B	.....	Private, Co. B, 74th Regt., Oct. 26th, 1871; Corporal, May 16, 1879; Sergeant, March 27, 1880; Second Lieutenant, Jan. 27, 1881; First Lieutenant, Aug. 12, 1881; Captain, April 27, 1883.	N. Y.
Albert J. Dance, Aug. 4, 1884	D	.....	Private, Co. D, 74th Regt., June 5, 1879; Corporal, Sept. 9, 1879; Sergeant, March 7, 1881; Second Lieutenant, July 31, 1882; First Lieutenant, Jan. 8, 1883; Captain, Aug. 4, 1884.	Eng.
William F. Dent, July 13, 1885	A	.....	Private, Co. D, 74th Regt., May 18, 1883; Second Lieutenant, May 22, 1883; First Lieutenant, Co. A, May 19, 1884; Captain, July 13, 1885.	Ont.
Frank N. Farrar, April 8, 1886	E	.....	Private, Co. C, 74th Regt., July 14, 1883; Sergeant, July 16, 1883; First Sergeant, March 3, 1884; Second Lieutenant, June 4, 1884; Captain, Co. E, April 8, 1886.	N. Y.
First Lieutenants.				
William J. Sloan, April 23, 1883	C	.....	First Lieutenant and Commissary Subsistence, 74th Regt., April 23, 1883; First Lieutenant, Co. C, May 12, 1886, with original rank.	N. Y.

INFANTRY — SEVENTY-FOURTH REGIMENT — *(Continued).*

NAME. GRADE AND DATE OF RANK.	Company.	SERVICE.		Born.
		In Armies of the United States.	In the National Guard.	
First Lieutenants—(Continued).				
Charles E. Oberst, May 30, 1883	G	Private, Co. H., 12th U. S. Infantry, Dec. 8, 1877; Corporal, Aug. 4, 1880; Sergeant, April 7, 1882; honorably discharged, Dec. 7, 1882.	Private, 74th Regt., May 7, 1877; dropped, Dec. 10, 1877; taken up, April 10, 1883; First Lieutenant, May 30, 1883.	N. Y.
William E. Otto, January 13, 1885	F		Private, Co. F, 74th Regt., May 6, 1881; Corporal, May 20, 1881; Sergeant, Sept. 16, 1881; First Sergeant, Oct. 19, 1882; First Lieutenant, Jan. 13, 1885.	N. Y.
Harrison C. Balcom, Feb. 11, 1885	B		Private, Co. B, 74th Regt., July 13, 1880; Corporal, Jan. 6, 1882; Sergeant, Aug. 1, 1882; First Sergeant, Feb. 25, 1884; Second Lieutenant, June 6, 1884; First Lieutenant, Feb. 11, 1885.	N. Y.
John F. Clark, April 8, 1886	E		First Lieutenant, Co. E, 74th Regt., April 8, 1886.	N. Y.
Benjamin L. Love, March 9, 1887	D		Private, Co. E, 74th Regt., April 8, 1886; First Sergeant, April 13, 1886; First Lieutenant, Co. D, March 9, 1887.	N. Y.
Second Lieutenants.				
William A. Angus, April 8, 1886	E		Private, Co. E, 74th Regt., April 8, 1886; Second Lieutenant, April 8, 1886.	N. Y.
George E. Gatley, May 12, 1886	C		Private, Co. E, 74th Regt., April 8, 1886; Sergeant, April 13, 1886; Second Lieutenant, Co. C, May 12, 1886.	N. Y.
Edmund P. Cottle, October 19, 1886	F		Private, Signal Corps, 8th Brigade, June 16, 1885; disbanded Aug. 5, 1886; Second Lieutenant, 74th Regt., October 19, 1886.	N. Y.

Henry L. Fish, Jr., March 9, 1887.....	D	.....	Private, Co. E, 74th Regt., April 8, 1886; Corporal, April 13, 1886; Second Lieutenant, Co. D, March 9, 1887.	N. Y.
Samuel Byron Newton, March 24, 1887,	B	.....	Private, Co. B, 74th Regt., Nov. 5, 1884; Second Lieutenant, March 24, 1887.	Cal.

INFANTRY — (*Continued*).

FIRST SEPARATE COMPANY.

Fourth Brigade.

Armory on Main street, Penn Yan, Yates county.

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Captain.			
Abraham Gridley, July 3, 1885	.....	Private, First Separate Company, Dec. 18, 1876; Corporal, March 16, 1882; Second Lieutenant, Sept. 18, 1882; First Lieutenant, Jan. 26, 1883; Captain, July 3, 1885.	N. Y.
First Lieutenant.			
George T. Wilkins, Oct. 5, 1885	.....	Private, First Separate Company, Sept. 8, 1875; Corporal, April 25, 1881; Sergeant, Oct. 21, 1882; discharged, Sept. 16, 1884; First Lieutenant, Oct. 5, 1885.	Eng.
Second Lieutenant.			
Andrew C. Harwick, January 26, 1883,	.....	Private, First Separate Company, January 11, 1878; Corporal, March 16, 1882; Second Lieutenant, January 26, 1883.	N. Y.
Assistant Surgeon — First Lieutenant.			
Benjamin L. Holt, September 8, 1883,	Acting Assist. Surgeon in U. S. A., May 1, 1875, to Dec. 11, 1876.	First Lieutenant and Assistant Surgeon, Sept. 8, 1883.	N. Y.

SECOND SEPARATE COMPANY.

Fourth Brigade.

State Armory at Auburn, Cayuga county.

Captain.			
W. Maurice Kirby, May 11, 1881; Brevet Lieutenant-Colonel, Aug. 10, 1881.	Private, 3d N. Y. vol. artillery, Jan. 1, 1862; Second Lieutenant, March 10, 1862; First Lieutenant, July 3, 1863; Captain, Feb. 17, 1865; honorably discharged, July 8, 1865.	First Lieutenant and Adjutant, 49th Regt., Nov. 29, 1876; Lieutenant-Colonel, Feb. 20, 1880; Supernumerary, Aug. 28, 1880; Captain, Second Separate Company, May 11, 1881.	N. Y.

First Lieutenant, Henry Silas Dunning, Dec. 28, 1886		Second Lieutenant, Second Separate Company, May 11, 1881; First Lieutenant, Dec. 28, 1886.	N. Y.
Second Lieutenant. Clarence James Barber, May 3, 1887		Private, Co. H, 54th Regt., Aug. 29, 1877; Corporal, Dec., 1877; Sergeant, 1878; discharged by disbandment; Private, Second Separate Company, May 24, 1881; Corporal, June 14, 1881; Sergeant, Dec. 30, 1882; Second Lieutenant, May 3, 1887.	N. Y.
Assistant Surgeon—First Lieutenant. John Gerin, July 16, 1883		Private, Second Separate Company, May 24, 1881; Assistant Surgeon, July 16, 1883.	Ont.

THIRD SEPARATE COMPANY.

Third Brigade.

Located at Oneonta, Otsego county.

Captain. Walter Scott, Sept. 28, 1886		Private, Third Separate Company, Dec. 29, 1880; Second Lieutenant, Aug. 1, 1881; First Lieutenant, Jan. 25, 1886; Captain, Sept. 28, 1886.	N. Y.
First Lieutenant. Burr Mattice, February 17, 1887		Private, Third Separate Company, Sept. 14, 1876; discharged, April 13, 1883; Private, Aug. 8, 1883; Quartermaster Sergeant, Aug. 19, 1883; Second Lieutenant, April 7, 1886; First Lieutenant, Feb. 17, 1887.	N. Y.
Second Lieutenant. Edwin G. Bixby, September 21, 1887	Private, Co. H, 5th N. Y. Volunteer Artillery, August 15, 1864, discharged, June 22, 1865.	Private, First Separate Company, July 26, 1875; Sergeant, Oct. 18, 1875; First Sergeant, Jan. 14, 1878; discharged, April 9, 1881; Private, Third Separate Company, July 1, 1884; Sergeant, April 1, 1886; Second Lieutenant, Sept. 21, 1887.	Ohio.
Assistant Surgeon—First Lieutenant. Benjamin A. Church, May 8, 1886		First Lieutenant and Assistant Surgeon, May 8, 1886.	N. Y.

INFANTRY — *(Continued).*

FOURTH SEPARATE COMPANY.

Third Brigade.

Located on Post lane, near Main street, at Yonkers, Westchester County.

NAME, GRADE AND DATE OF RANK.	SERVICE.		BORN.
	In the Armies of the United States.	In the National Guard.	
Captain.			
John Isaac Pruyn, November 26, 1887,	.....	Private, Co. D, 16th Battalion, June 6, 1874; Corporal, March 11, 1876; Sergeant, Feb. 7, 1877; First Sergeant, Feb. 12, 1880; Sergeant Major, March 23, 1880; honorably discharged Dec. 10, 1881; Private, 4th Separate Company, Jan. 2. 1882; First Sergeant, March 2, 1882; Second Lieutenant, Feb. 1, 1884; First Lieutenant, Aug. 5, 1885; Captain, Nov. 26, 1887.	N. Y.
Second Lieutenant.			
William H. McVicar, August 5, 1885..	.....	Private, 4th Separate Company, Sept. 4, 1874; Corporal, Feb. 12, 1880; Sergeant, Dec. 10, 1881; First Sergeant, March 7, 1884; Second Lieutenant, August 5, 1885.	N. Y.
Assistant Surgeon — First Lieutenant.			
George F. Whitney, June 28, 1886.....	.....	First Lieutenant and Assistant Surgeon, 4th Separate Company, June 28, 1886.	Pa.

FIFTH SEPARATE COMPANY.

Third Brigade.

State Armory at Broadway, corner Johnson street, Newburgh, Orange county.

Captain.			
James T. Chase, March 17, 1881.....	Sergeant, Co. D, 19th militia, mustered in U. S. service, May 26, 1862, for three months; discharged, Sept. 6, 1862; First Lieutenant, Co. G, 168th N. Y. vols. (19th militia), Jan. 12, 1863, nine months; mustered out Oct. 31, 1863; Private, Co. A, 56th N. Y. vols., Feb. 23, 1865; honorably discharged, Oct. 17, 1865.	Private, Co. D, 19th N. Y. S. militia, Sept. 22, 1858; Sergeant, May 26, 1862; First Lieutenant, March 28, 1866; Captain, Feb. 12, 1868; discharged by disbandment, May 9, 1878; Adjutant, 17th Battalion, Oct. 10, 1878; Captain, Co. A, March 17, 1881, which company became the 5th Separate Company, January 1, 1882.	N. Y.
First Lieutenant.			
John H. Wells, November 23, 1883....	.....	Private, Co. E, 19th Regt., Sept. 6, 1869; disbanded, February, 1877; First Lieutenant, Co. C, 17th Battalion, July 25, 1878; Supernumerary, June 11, 1881; First Lieutenant, 5th Separate Company, Nov. 23, 1883.	N. Y.
Second Lieutenant.			
George W. Dunn, December 1, 1887..	.....	Private, 5th Separate Company, Feb. 16, 1883; Sergeant, Dec. 3, 1884; Second Lieutenant, Dec. 1, 1887.	N. Y.

SIXTH SEPARATE COMPANY.

Third Brigade.

State Armory, River street, near Ferry street, Troy, Rensselaer county.

Captain.			
James W. Cusack, Feb. 3, 1877; Brevet Lieutenant-Colonel, March 10, 1877..	.....	Captain, Co. G, 24th Regt., Sept. 12, 1862; Major, Aug. 2, 1867; Lieutenant-Colonel, Jan. 6, 1869; honorably discharged, Oct. 4, 1869; Captain, Sixth Separate Company, Feb. 3, 1877.	N. Y.

INFANTRY — SIXTH SEPARATE COMPANY — *(Continued).*

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
First Lieutenant.			
James L. Thompson, January 22, 1883,	.....	Private, Sixth Separate Company, Jan. 22, 1877; Sergeant, March 6, 1877; Private, May 2, 1878; Second Lieutenant, Jan. 22, 1879; First Lieutenant, Jan. 22, 1883.	N. Y.
Second Lieutenant.			
George D. Smith, January 22, 1883....	Private, Co. K, 2d N. Y. vols., May 20, 1861; Corporal; Sergeant; First Sergeant; honorably discharged as such on account of wounds, September 24, 1862.	Sergeant, Co. D, 24th Regt., First Sergeant; First Lieutenant, Jan. 18, 1866; Quartermaster, 24th Regt., resigned Oct. 5, 1868; Private, Sixth Separate Company, Jan. 22, 1877; Sergeant, March 6, 1877; Private, July 8, 1877; honorably discharged, March 23, 1882; Private, Sixth Separate Company, March 27, 1882; Second Lieutenant, Jan. 22, 1883.	N. Y.
Assistant Surgeon — First Lieutenant.			
Clarkson C. Schuyler, August 23, 1883,	.....	Assistant Surgeon, Sixth Separate Company, August 23, 1883.	N. Y.

SEVENTH SEPARATE COMPANY.

Third Brigade.

Located at Harmony Hotel, Cohoes, Albany county.

Captain.			
Parker G. Tymerson, May 7, 1884.....	Private, Battery H, 3d Regt., N. Y. vol. artillery, Oct. 15, 1861; Corporal, July, 1864; honorably discharged, November 24, 1864.	First Lieutenant, Seventh Separate Company, Jan. 9, 1882; Captain, May 7, 1884.	N. Y.

First Lieutenant.			
T. Campbell Collin, May 7, 1884.....	.....	Private, Third Separate Company, Feb. 24, 1876; Corporal, Jan. 23, 1878; First Sergeant, Oct. 5, 1878; honorably discharged, June 8, 1881; Second Lieutenant, Seventh Separate Company, Feb. 21, 1881; First Lieutenant, May 7, 1884.	Eng.
Second Lieutenant.			
Thomas J. McNeil, June 20, 1884.....	.....	Private, Seventh Separate Company, May 15, 1880; Sergeant, April 18, 1882; First Sergeant, June 18, 1884; Second Lieutenant, June 20, 1884.	Ire.
Assistant Surgeon—First Lieutenant.			
James H. Mitchell, Nov. 10, 1886.....	.....	.....	.....

EIGHTH SEPARATE COMPANY.

Fourth Brigade.

State Armory at Rochester, Monroe county.

Captain.			
Henry B. Henderson, July 12, 1865; Brevet Major, March 29, 1877	Second Lieutenant, 54th Regt., N. G. S. N. Y., 100 days' service at Elmira, N. Y., July 26, 1864; discharged, Nov. 10, 1864.	Private, Co. E, 54th Regt., Aug. 24, 1863; Second Lieutenant, March 2, 1864; Captain, July 12, 1865.	N. Y.
First Lieutenant.			
Frank J. Hess, March 12, 1886	.....	Second Lieutenant, Eighth Separate Company, April 15, 1885; First Lieutenant, March 12, 1886.	N. Y.
Second Lieutenant.			
Frederick W. G. Bailey, March 2, 1887,	.....	Private, Eight Separate Company, Oct. 2, 1878; Corporal, April 5, 1881; Sergeant, April 7, 1886; Second Lieutenant, March 2, 1887.	Can.
Assistant Surgeon—First Lieutenant.			
.....	.....	.....	.....

INFANTRY—*(Continued)*.

NINTH SEPARATE COMPANY.

Third Brigade.

Located at Whitehall, Washington County.

NAME, GRADE AND DATE OF RANK.	SERVICE.		BORN.
	In the Armies of the United States.	In the National Guard.	
Captain.			
First Lieutenant.			
Thomas A. Patterson, June 15, 1887...	.....	Private, Second Separate Co., April 27, 1876; Quartermaster-Sergeant, Nov. 12, 1877; honorably discharged, June 1, 1881; Private, Ninth Separate Co., June 13, 1881; First Sergeant, Dec. 11, 1882; First Lieutenant, June 15, 1887.	N. Y.
Second Lieutenant.			
Robert A. Hall, April 20, 1882	.....	Private, Second Separate Company, June 14, 1876; Second Lieutenant, Ninth Separate Company, April 20, 1882.	N. Y.
First Lieutenant and Assistant Surgeon.			
Benjamin C. Senton, April 4, 1884	.....	Private, Ninth Separate Company, April 27, 1876; honorably discharged, June 1, 1881; Assistant Surgeon, April 4, 1884.	N. Y.

TENTH SEPARATE COMPANY.

Third Brigade.

State Armory at Newburgh, Orange county.

Captain			
.....	.....	.....	.....

First Lieutenant. William J. Whited, Jan. 17, 1887	.....	Private, Co. E, 17th Battalion, Jan. 2, 1880; Corporal, Tenth Separate Company, March 31, 1884; Second Lieutenant, May 17, 1886; First Lieutenant, Jan. 17, 1887.	N. Y.
Second Lieutenant. Thomas T. Haviland, April 4, 1887	.....	Private, Tenth Separate Co., Oct. 1, 1883; Corporal, Jan. 7, 1885; Second Lieutenant, April 4, 1887.	N. Y.

ELEVENTH SEPARATE COMPANY.

Third Brigade.

Armory at Fourth Avenue Hall, Mt. Vernon, Westchester county.

Captain. Isaac N. Pressey, December 21, 1885	.....	Second Lieutenant, Co. B, 3d Regt., Conn. N. G., Jan. 19, 1872; First Lieutenant, Feb. 5, 1872; honorably discharged, Sept. 30, 1872; First Lieutenant, Eleventh Separate Company, Dec. 10, 1884; Captain, Dec. 21, 1885.	Conn
First Lieutenant. Edward J. Kindler, December 21, 1885,	.....	Private, Separate Troop E, Aug. 28, 1876; Sergeant, May 20, 1878; First Sergeant, Fifteenth Separate Company May 23, 1883; Second Lieutenant, Jan. 26, 1885; First Lieutenant, Dec. 21, 1885.	N. Y.
Second Lieutenant. Joseph E. Taverner, December 21, 1885	.....	Private, First Separate Troop, July 16, 1877; Corporal, Separate Troop E, April 4, 1879; Sergeant, Eleventh Separate Company, March 2, 1882; First Sergeant, Feb. 8, 1885; Second Lieutenant, Dec. 21, 1885.	N. Y.
Assistant Surgeon—First Lieutenant. Stuart B. Carlisle, June 14, 1883	.....	Assistant Surgeon and First Lieutenant, June 14, 1883.	N. Y.

INFANTRY—*(Continued).*

TWELFTH SEPARATE COMPANY.

Third Brigade.

State Armory on River street, between Congress and Ferry streets, Troy, Rensselaer County.

NAME, GRADE AND DATE OF RANK.	SERVICE.		BORN.
	In the Armies of the United States.	In the National Guard.	
Captain. Joseph Egolf, May 18, 1876; Brevet Col., April 16, 1877	Private Co. D, 2d N. Y. vols., April 19, 1861; First Sergeant, May 14, 1861; Second Lieutenant, Sept. 16, 1861; First Lieutenant, Aug. 31, 1862; Captain, Nov. 10, 1862; honorably discharged, May 23, 1863; First Lieutenant 125th N. Y. vols., March 28, 1864; Captain, May 8, 1864; Major, Nov. 10, 1864; honorably discharged (loss of right arm), Jan. 5, 1865; State Brevet Lieut.-Col., N. Y. vols., May 13, 1866.	Lieutenant-Colonel and Ordnance Officer, 3d Div. N. G. S. N. Y., May 4, 1867; Colonel and Engineer, 3d Division, Sept. 25, 1872; Chief of Artillery, October 6, 1873; resigned April 28, 1876; Captain Fourth (now Twelfth) Separate Company, May 18, 1876.	Pa.
First Lieutenant.			
.....	.....	.....	.....
Second Lieutenant. Alonzo W. Hill, June 23, 1886	Private, 34th N. Y. vols.....	Corporal, Fourth (now Twelfth) Separate Company, May 30, 1876; Sergeant Oct. 26, 1881; Second Lieutenant, June 23, 1886.	N. Y.

THIRTEENTH SEPARATE COMPANY.

Fourth Brigade.

Armory in Opera House at Jamestown, Chautauqua county.

Captain.			
Henry Smith, May 31, 1887		Captain, Thirteenth Separate Company, May 31, 1887.	N. Y.
First Lieutenant.			
Second Lieutenant.			
First Lieutenant and Assistant Surgeon.			
William Marvin Bemus, Sept. 23, 1887,		Assistant Surgeon, Thirteenth Separate Company, Sept. 23, 1887.	Pa.

FOURTEENTH SEPARATE COMPANY.

Third Brigade.

Armory at Union avenue, Kingston, Ulster county.

Captain.			
First Lieutenant.			
John G. Van Etten, April 14, 1887		Private, Fourteenth Separate Company, Nov. 29, 1883; Corporal, April 3, 1884; Second Lieutenant, Sept. 3, 1885; First Lieutenant, April 14, 1887.	N. Y.
Second Lieutenant.			
Theodore DuBois Frear, Nov. 3, 1887.		Private, Co. D, 2d Battalion, Colorado N. G., 1882; Second Lieutenant from June to Sept. 1, 1883; Second Lieutenant Fourteenth Separate Company, Nov. 3, 1887.	N. Y.
Assistant Surgeon — First Lieutenant.			
Charles W. Crispell, Nov. 20, 1883		Assistant Surgeon, Fourteenth Separate Company, Nov. 20, 1883.	N. Y.

INFANTRY — *(Continued).*

FIFTEENTH SEPARATE COMPANY.

Third Brigade.

Armory, from 278 to 282 Main street, Poughkeepsie, Dutchess County.

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Captain.			
Berthold Myers, Sept. 11, 1879	Private, Co. D, 57th N. Y. vols., Oct. 12, 1861; honorably discharged (loss of right arm), Dec. 13, 1862.	Private, Co. A, 21st Regt., Sept. 11, 1874; Second Lieutenant, Co. F, Oct. 20, 1876; First Lieutenant, Co. A, May 24, 1878; Captain, Co. A (now Fifteenth Separate Company), Sept. 11, 1879.	Ger.
First Lieutenant.			
.....	.....	.....	.....
Second Lieutenant.			
.....	.....	.....	.....

SIXTEENTH SEPARATE COMPANY.

Third Brigade.

Armory, corner Main and William streets, Catskill, Greene County.

Captain.			
Arthur M. Murphy, Feb. 24, 1883	.....	First Lieutenant, Sixteenth Separate Company, Oct. 22, 1879; Captain, Feb. 24, 1883.	Mass
First Lieutenant.			
.....	.....	.....	.....
Second Lieutenant.			
Robert P. Forshew, May 10, 1886	Naval Cadet and Cadet Midshipman, U. S. Navy, June 20, 1876, to July 1, 1883.	Second Lieutenant, Sixteenth Separate Company, May 10, 1886.	N. Y.

Assistant Surgeon—First Lieutenant.			
William P. McLawry, May 11, 1883...	Private, Co. B, 144th N. Y. vols., Aug. 25, 1864; honorably discharged, June 25, 1865.	Private, Sixteenth Separate Company, Oct. 22, 1879; First Lieutenant and Assistant Surgeon, May 11, 1883.	N. Y.

SEVENTEENTH SEPARATE COMPANY.

Second Brigade.

Armory on Broadway, corner Lawrence avenue, Flushing, Queens county.

Captain.			
Thomas Miller, Jr., Feb. 25, 1880.....	.....	First Lieutenant, Seventeenth Separate Company, June 20, 1878; Captain, Feb. 25, 1880.	N. Y.
First Lieutenant.			
Frank N. Bell, March 1, 1887.....	.....	Private, Seventeenth Separate Company, Sept. 18, 1879; First Sergeant, Feb. 10, 1880; First Lieutenant, March 1, 1887.	Conn
Second Lieutenant.			
.....	.....	.....	.....

EIGHTEENTH SEPARATE COMPANY.

Third Brigade.

Armory in Opera House block, Glens Falls, Warren county.

Captain.			
James S. Garrett, Feb. 2, 1880.....	Private, Co. A, 118th N. Y. vols., Aug. 10, 1862; First Sergeant, Aug. 29, 1862; Second Lieutenant, Feb. 13, 1863; First Lieutenant, March 8, 1864; honorably discharged Oct. 11, 1865; Brevet Captain, N. Y. vols.	Captain, Eighteenth Separate Company, Feb. 2, 1880.	N. Y.
First Lieutenant.			
John H. Leonard, May 7, 1886.....	Private, Co. A, 2d N. Y. Vet. Cav., Aug. 29, 1863; Corporal, Feb., 1865; discharged Nov. 8, 1865.	Private, Eighteenth Separate Company, Jan. 21, 1879; Second Lieutenant, April 30, 1879; First Lieutenant, May 7, 1886.	N. Y.
Second Lieutenant.			
.....	.....	.....	.....

INFANTRY—EIGHTEENTH SEPARATE COMPANY—*(Continued)*.

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
First Lieutenant and Assistant Surgeon.			
Fred. B. Streeter, Jan. 7, 1887		First Lieutenant and Assistant Surgeon, Jan. 7, 1887.	N. Y.

NINETEENTH SEPARATE COMPANY.

Third Brigade.

Armory, 278 to 282 Main street, Poughkeepsie, Dutchess county.

Captain.			
Wm. Haubennestel, Nov. 12, 1866; Brevet-Major, Feb. 2, 1876	Second Lieutenant, Co. D, 21st N. G. S. N. Y., in U. S. service for thirty days, June 22 to Aug. 6, 1863.	Private Co. D, 21st Regt., May 2, 1860; Sergeant, July 2, 1861; First Sergeant, July 3, 1862; Second Lieutenant, Nov. 3, 1862; First Lieut., April 2, 1866; Captain Nov. 12, 1866.	N. Y.
First Lieutenant.			
Louis P. Haubennestel, Aug. 6, 1873		Private Co. D, 21st Regt., June 26, 1862; Corporal, July, 1863; Sergeant, July 5, 1865; First Sergeant, July 11, 1866; Second Lieutenant, Aug. 9, 1871; First Lieutenant, Aug. 6, 1873.	N. Y.
Second Lieutenant.			
Martin L. Beutell, Jan. 2, 1878	Private, 58th N. Y. vols., Sept. 1, 1861; Corporal, Oct. 1, 1864; honorably discharged Oct. 1, 1865.	Private, Co. D, 21st Regt., June 3, 1867; Sergeant, July 6, 1870; First Sergeant, July 3, 1872; Second Lieutenant, Jan. 2, 1878.	N. J.
Assistant Surgeon—First Lieutenant.			
John P. Wilson, Sept. 20, 1883		Private, Co. I, 27th Regt., Aug. 20, 1861; Sergeant, Oct. 1, 1861; discharged for disability in 1863; Assistant Surgeon, Nineteenth Separate Company, Sept. 20, 1883.	N. Y.

TWENTIETH SEPARATE COMPANY.

Third Brigade.

Armory at Binghamton, Broome county.

Captain.			
Hiram C. Rogers, May 27, 1884	Captain, 27th N. Y. vols., May 21, 1861; March, 1862, Captain and Assistant Adjutant-General, U. S. vols.; Major and Assistant Adjutant-General, July 4, 1862; Lieutenant-Colonel and Assistant Adjutant-General, Nov. 1862, resigned Jan. 31, 1865; Brevet Brig.-Gen'l U. S. vols., March 13, 1865.	Captain, Twentieth Separate Company, May 27, 1884.	N. Y.
First Lieutenant.			
Charles F. Tupper, May 24, 1883		Private, Twentieth Separate Company, March 11, 1878; Corporal, Aug. 14, 1879; Sergeant, July 28, 1881; honorably discharged, April 9, 1883; Private, April 13, 1883; First Lieutenant, May 24, 1883.	N. Y.
Second Lieutenant.			
Frank D. Lyon, July 2, 1883		Adjutant, 44th Regt., March 21, 1877; disbanded Dec. 8, 1877; Second Lieutenant, Twentieth Separate Company, July 2, 1883.	N. Y.
Assistant Surgeon—First Lieutenant.			
Daniel S. Burr, May 31, 1883		Surgeon, 28th Brigade, Oct. 15, 1875; discharged, Dec. 8, 1877; First Lieutenant and Assistant Surgeon, Twentieth Separate Company, May 31, 1883.	N. Y.

TWENTY-FIRST SEPARATE COMPANY.

Third Brigade.

State Armory on River, between Congress and Ferry streets, Troy.

Captain.			
Samuel Foster, Oct. 13, 1884		First Lieutenant, Co. G, 92d Regt., Aug., 1863; resigned Sept., 1867; Private, Ninth Separate Company, Feb. 7, 1877; First Lieut., Twenty-first Separate Company, July 10, 1878; Captain, Oct. 13, 1884.	N. Y.

INFANTRY—TWENTY-FIRST SEPARATE COMPANY—*(Continued)*.

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
First Lieutenant. Lawrence Buckley, Feb. 13, 1885		Private, Co. E, 24th Regt., Sept., 1865 to 1868; Color-Sergeant; disbanded, 1875; Private, Twenty-first Separate Company, May 11, 1880; Second Lieutenant, Sept. 12, 1881; resigned, July 7, 1884; First Lieutenant, Feb. 13, 1885.	.....
Second Lieutenant. Merrill M. Dunspaugh, Oct. 13, 1884		Private, Twenty-first Separate Company, March 1, 1877; Corporal, Oct., 1879; First Sergeant, Sept., 1881; discharged, Feb. 21, 1883; Private, March 1, 1883; First Sergeant, April 16, 1883; Second Lieutenant, Oct. 13, 1884.	N. Y.

TWENTY-SECOND SEPARATE COMPANY.

Third Brigade.

Armory at Town Hall, Saratoga Springs, Saratoga county.

Captain. Robert C. McEwen, May 28, 1883	Assistant Surgeon, 17th Connecticut vols., August 16, 1862; resigned, September 30, 1863.	Captain, Twenty-second Separate Company, May 28, 1883.	N. Y.
First Lieutenant. Arthur Louis Hall, January 26, 1885		Second Lieutenant, Twenty-second Separate Company, May 28, 1883; First Lieutenant, January 26, 1885.	N. Y.
Second Lieutenant. Waldo L. Rich, April 20, 1885		Private, Twenty-second Separate Company, Nov. 25, 1884; Corporal, Jan. 24, 1885; Second Lieutenant, April 20, 1885.	N. Y.

TWENTY-THIRD SEPARATE COMPANY.

Third Brigade.

Armory in rear of Court-house at Hudson, Columbia county.

Captain.			
.....	.....	.....	.....
First Lieutenant.			
Reuben Reynolds, December 14, 1880,	Private, Co. A, 128th N. Y. vols., Aug. 2, 1862; Corporal, Aug. 10, 1862; Sergeant, Feb. 10, 1863; discharged, Aug. 30, 1863; First Lieutenant, Co. A, 19th Regt., Corps D'Afrique (later 90th Regt., U. S. colored troops), Sept. 19, 1863; discharged, Sept. 20, 1864.	Sergeant, Twenty-third Separate Company, May 24, 1878; First Sergeant, Dec. 16, 1878; Second Lieutenant, Feb. 4, 1879; First Lieutenant, December 14, 1880.	N. Y.
Second Lieutenant.			
Henry Waterman, November 16, 1886,	.....	Private, Twenty-third Separate Company, May 24, 1878; Corporal, August 6, 1878; Sergeant, Sept. 8, 1882; First Sergeant, May 28, 1885; Second Lieutenant, Nov. 16, 1886.	N. Y.
Assistant Surgeon—First Lieutenant.			
Crawford E. Fritts, April 23, 1883.....	.....	Private, Twenty-third Separate Company, May 24, 1878; First Lieutenant and Assistant Surgeon, April 23, 1883.	N. Y.

TWENTY-FOURTH SEPARATE COMPANY.

Third Brigade.

Armory, Middleton, Orange county; organized by S. O. No. 23, *A. G. O., March* 17, 1887.

Captain.			
Charles B. Wood, March 17, 1887.....	Private, Co. I, 71st militia, April 19, 1861, to May 31, 1861; First Lieutenant, 124th N. Y. vols., Aug. 12, 1862; Captain, July 2, 1863; discharged Sept. 21, 1864; Brevet Major, N. Y. vols.	Captain, 24th Separate Company, March 17, 1887.	N. Y.

INFANTRY—TWENTY-FOURTH SEPARATE COMPANY—*(Continued)*.

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
First Lieutenant. Amos E. McIntyre, March 17, 1887		First Lieutenant, 24th Separate Company, March 17, 1887.	N. Y.
Second Lieutenant. Lewis S. Stivers, March 17, 1887		Second Lieutenant, 24th Separate Company, March 17, 1887.	N. Y.

TWENTY-FIFTH SEPARATE COMPANY.

Fourth Brigade

Armory, corner Main and Niagara streets, Canandaigua, Ontario county.

Captain. John Raines, July 5, 1878	Captain, 85th N. Y. vols., Oct. 29, 1861; resigned July 4, 1863.	Captain, Twenty-fifth Separate Company, July 5, 1878.	N. Y.
First Lieutenant. Charles H. Paddock, July 5, 1878			N. Y.
Second Lieutenant. Jerome C. Fredenburg, Dec. 17, 1884		Private, Twenty-fifth Separate Company, July 18, 1878; Corporal, Feb. 12, 1879; Sergeant, Aug. 22, 1881; First Sergeant, May 10, 1884; Second Lieutenant, Dec. 17, 1884.	Mich.
First Lieutenant and Assistant Surgeon. Albert L. Beahan, Feb. 21, 1885		Assistant Surgeon, Medical Department, on duty with Twenty-fifth Separate Co., Feb. 1, 1885.	.....

TWENTY-SIXTH SEPARATE COMPANY.

Fourth Brigade.

Armory in the Academy of Music, at corner of Baldwin and Carroll streets, Elmira, Chemung county.

Captain.			
First Lieutenant.			
Second Lieutenant.			
First Lieutenant and Assistant Surgeon.			
Floyd B. Parke, May 20, 1887		Private 30th Separate Company, Jan. 22, 1886; Assistant Surgeon, 26th Separate Company, May 20, 1887.	N. Y.

TWENTY-SEVENTH SEPARATE COMPANY.

Third Brigade.

Armory on Webster street, Malone, Franklin county.

Captain.			
First Lieutenant.			
George W. Crooks, October 6, 1887		Private, 27th Separate Company, July 22, 1878; Sergeant, June 13, 1884; First Lieutenant, Oct. 6, 1887.	Pa.
Second Lieutenant.			

INFANTRY—*(Continued).*

TWENTY-EIGHTH SEPARATE COMPANY.

Third Brigade.

State Armory at Utica, Oneida County.

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Captain.			
Joseph H. Remmer, June 3, 1873		Private, Co. B, 26th Regt., Sept. 2, 1868; Sergeant, Sept. 2, 1868; transferred to Co. C, March 10, 1873; Captain, Co. C, 26th Battalion, June 3, 1873.	N. Y.
First Lieutenant.			
Charles F. Clark, May 29, 1876		Private, Co. C, 26th Battalion, June 3, 1873; Sergeant in Jan., 1874; Second Lieutenant, Feb. 8, 1875; First Lieutenant, May 29. 1876.	Eng.
Second Lieutenant.			
Alfred T. Rycrart, July 28, 1884		Private, Twenty-eighth Separate Company, April 2, 1883; Second Lieutenant, July 28, 1884.	Eng.

TWENTY-NINTH SEPARATE COMPANY.

Fourth Brigade.

State Armory at Oswego, Oswego county.

Captain.			
Hugh H. Herron, March 1, 1877	Private, 24th N.Y. vols., April 19, 1861; discharged as Sergeant, June 2, 1863.	Private, Co. R, 48th Regt., Aug. 5, 1859; dropped by entry in vol. service, April 19, 1861; Private, Co. A, 48th Regt., Dec. 15, 1863; First Sergeant, Feb. 7, 1864; Captain, March 1, 1877.	Ire.

First Lieutenant. William Monaghan, Feb. 23, 1887	Private, Battery A, 4th U. S. Artillery, Feb. 6, 1861; Corporal, Aug. 10, 1861; Sergeant, Nov. 15, 1861; discharged Feb. 6, 1866; re-enlisted same day, Battery A, 1st U. S. Artillery; Corporal, Nov. 1, 1866; Sergeant, Nov. 1, 1867; discharged, Feb. 6, 1881.	Private, Twenty-ninth Separate Company, June 12, 1882; Sergeant, July 20, 1882; First Sergeant, Oct. 24, 1883; First Lieutenant, February 23, 1887.	Ire.
Second Lieutenant.			
.....	.....	.....	.....
First Lieutenant and Assistant Surgeon.			
.....	.....	.....	.....

THIRTIETH SEPARATE COMPANY.

Fourth Brigade.

Armory on Carroll, between Lake and Baldwin streets, Elmira, Chemung county.

Captain. Roscius Morse, Feb. 5, 1885	.....	Private, Thirtieth Separate Company, Oct. 1, 1874; Corporal, Oct. 1, 1874; Sergeant, March 3, 1876; Captain, Feb. 5, 1885.	N. Y.
First Lieutenant. Edward M. Hoffman, May 11, 1887	.....	Private, Co. D, 110th Battalion, Oct. 1, 1874; Second Lieutenant, April 7, 1877; First Lieutenant, Thirtieth Separate Company, Nov. 29, 1881; Lieutenant-Colonel and Assistant Adjutant-General, 7th Brig., Dec. 6, 1884; Supernumerary, Aug. 5, 1886; First Lieutenant, Thirtieth Separate Company, May 11, 1887.	N. Y.
Second Lieutenant. John T. Saddler, May 11, 1887	.....	Corporal, Co. D, 110th Battalion, Oct. 1, 1874; Sergeant, March 3, 1876; First Sergeant, April 7, 1877; Second Lieutenant, Thirtieth Separate Company, Nov. 29, 1881; Major and Inspector, 7th Brigade, Dec. 6, 1884; Supernumerary, Aug. 5, 1886; First Lieutenant, Thirtieth Separate Company, May 11, 1887.	N. Y.

INFANTRY — *(Continued).*

THIRTY-FIRST SEPARATE COMPANY.

Third Brigade.

Armory on Otsego street, Mohawk, Herkimer County.

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Captain.			
Andrew I. Budlong, May 20, 1884			
First Lieutenant.			
Delos M. Dodge, Feb. 8, 1886		Private, Thirty-first Separate Company, Nov. 18, 1878; Corporal, Jan. 13, 1879; First Sergeant, May 24, 1880; discharged, Dec. 21, 1883; Private Feb. 4, 1884; First Sergeant, June 12, 1884; First Lieutenant, Feb. 8, 1886.	N. Y.
Second Lieutenant.			
James M. Bellinger, Dec. 6, 1880		Private, Thirty-first Separate Company, March 8, 1879; Second Lieutenant, Dec. 6, 1880.	N. Y.

THIRTY-SECOND SEPARATE COMPANY.

Third Brigade.

Located at Hoosick Falls.

Captain.			
Charles W. Eddy, March 20, 1885		Captain, March 20, 1885	N. Y.
First Lieutenant.			
Frank L. Stevens, March 20, 1885		First Lieutenant, March 20, 1885	N. Y.
Second Lieutenant.			
George H. Walden, March 20, 1885		Second Lieutenant, March 20, 1885	Mass.

First Lieutenant and Assistant Surgeon.			
Lourie Ashton, Aug. 20, 1887.....	.....	Assistant Surgeon, Thirty-second Separate Company, Aug. 20, 1887.	Iowa.

THIRTY-THIRD SEPARATE COMPANY.

Third Brigade.

Armory on Delaware street, at Walton, Delaware county.

Captain.			
Matthew W. Marvin, May 20, 1879....	First Lieutenant, Co. B, 144th N. Y. vols., Sept. 1, 1862; Captain, March 3, 1863; honorably discharged, June 25, 1865.	Adjutant, 100th Regt., July 1, 1866; Major, July 20, 1867; Supernumerary, June 5, 1868; Captain Thirty-third Separate Company, May 20, 1879.	N. Y.
First Lieutenant.			
Harvey B. Moremus, May 20, 1879....	Private Co. E, 3d N. Y. vol. cavalry, Aug. 22, 1861; re-enlisted as a veteran in the field, Jan. 4, 1864; Corporal, Sept. 8, 1864; Sergeant, Sept. 13, 1864; honorably discharged, July 12, 1865.	First Lieutenant, Thirty-third Separate Company, May 20, 1879.	N. Y.
Second Lieutenant.			
George C. Robinson, May, 20, 1879....	Private, Co. D, 72d Regt. N. Y. vols., April, 1861; Corporal, May 1863; Sergeant, June 1863; First Sergeant, Dec. 1863; re-enlisted as a veteran in the field, Dec. 24, 1863; transferred to Co. A, 120th N. Y. vols., June, 1864, as Sergeant; honorably discharged, Oct., 1864, as Supernumerary N. C. O.	Second Lieutenant, Thirty-third Separate Company, May 20, 1879.	N. Y.
First Lieutenant and Assistant Surgeon.			
William B. Morrow, Sept. 10, 1886.....	.....	First Lieutenant and Assistant Surgeon, Thirty-third Separate Company, Sept. 10, 1886.	N. Y.

INFANTRY — *(Continued).*

THIRTY-FOURTH SEPARATE COMPANY.

Fourth Brigade.

Armory on Union alley, near Seneca street, at Geneva, Ontario County.

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Captain.			
William Wilson, October 6, 1884		Private, Thirty-fourth Separate Company, Jan. 21, 1880; First Lieutenant, Feb. 23, 1882; Captain, Oct. 6, 1884.	N. Y.
First Lieutenant.			
George C. Schell, November 7, 1884		Private, Thirty-fourth Separate Company, Jan. 21, 1880; First Lieutenant, Nov. 7, 1884.	N. Y.
Second Lieutenant.			
Frederick A. Malette, Feb. 3, 1887		Private, Thirty-fourth Separate Company, Jan. 21, 1880; First Sergeant, 1885; Second Lieutenant, Feb. 3, 1887.	N. Y.

THIRTY-FIFTH SEPARATE COMPANY.

Fourth Brigade.

Armory at Ogdensburgh, St. Lawrence county.

Captain.			
Henry Holland, Feb. 8, 1887		First Lieutenant, Thirty-fifth Separate Company, Nov. 9, 1885; Captain, Feb. 8, 1887.	N. Y.
First Lieutenant.			
Lawrence M. Proctor, April 19, 1887		Private, Thirty-fifth Separate Company, Nov. 18, 1886; Second Lieutenant, Dec. 29, 1885; First Lieutenant, April 19, 1887.	N. Y.

Second Lieutenant.			
Dennis B. Lucey, July 14, 1887		Private, Thirty-fifth Separate Company, Nov. 18, 1885; First Sergeant, Dec. 29, 1885; Second Lieutenant, July 14, 1887.	Mass
Assistant Surgeon — First Lieutenant.			
John W. Benton, April 28, 1887		Assistant Surgeon, Thirty-fifth Separate Company, April 28, 1887.	N. Y.

THIRTY-SIXTH SEPARATE COMPANY.

Third Brigade.

Armory on Park, at junction of State and Albany streets, Schenectady, Schenectady county.

Captain.			
Austin A. Yates, June 12, 1880	Captain, Co. H, 134th N. Y. vols., Sept. 22, 1862; honorably discharged, June 9, 1863; Captain, Veteran Reserve Corps, Aug. 18, 1863; mustered out, Aug. 6, 1866; Brevet Major, U. S. vols.	Captain, Thirty-sixth Separate Company, June 12, 1880.	N. Y.
First Lieutenant.			
James F. White, Nov. 8, 1883	Private, Co. A, 192d N. Y. vols., Feb. 15, 1865; discharged, Aug. 13, 1865; Private, Co. E, 4th U. S. cavalry, Sept. 26, 1872; Sergeant; discharged, Sept. 1877.	Private, Thirty-sixth Separate Company, May 31, 1880; Sergeant, June 12, 1880; First Sergeant; Second Lieutenant, June 15, 1881; First Lieutenant, Nov. 8, 1883.	N. Y.
Second Lieutenant.			
J. Edward Swanker, June 1, 1886		Second Lieutenant, Thirty-sixth Separate Company, June 1, 1886.	N. Y.
First Lieutenant and Assistant Surgeon.			
Wm. T. Clute, Dec. 31, 1883		Assistant Surgeon, Thirty-sixth Separate Company, Dec. 31, 1883.	N. Y.

THIRTY-SEVENTH SEPARATE COMPANY.

Third Brigade.

Armory on Park, at junction of State and Albany streets, Schenectady.

Captain.			
George W. Marlette, Dec. 27, 1883	Private, Co. E, 18th N. Y. vols., Aug. 22, 1861; honorably discharged, May 28, 1863.	Captain, 83d Regt., N. G. S. N. Y., Dec. 28, 1867; Major, May 27, 1871; Supernumerary, 1873; Captain, Thirty-seventh Separate Company, Dec. 27, 1883.	N. Y.

INFANTRY — THIRTY-SEVENTH SEPARATE COMPANY — *(Continued).*

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
First Lieutenant.			
Thomas Gregg, March 15, 1882		Second Lieutenant, Thirty-seventh Separate Company, June 12, 1880; First Lieutenant, March 15, 1882.	N. Y.
Second Lieutenant.			
James H. Vedder, July 29, 1882		First Sergeant, Thirty-seventh Separate Company, June 12, 1880; Second Lieutenant, July 29, 1882.	N. Y.

THIRTY-EIGHTH SEPARATE COMPANY.

Fourth Brigade.

State Armory at Oswego, Oswego county.

Captain.			
Frank J. Stearns, March 11, 1886		Private, Co. F, 48th Regt., now Thirty-eighth Separate Company, Jan. 7, 1878; Sergeant, June 22, 1878; Second Lieutenant, Feb. 26, 1884; First Lieutenant, July 25, 1884; Captain, March 11, 1886.	N. Y.
First Lieutenant.			
De Solvo H. Tifft, July 12, 1886		Private, Co. A, 48th Regt., March 17, 1870; discharged, Jan. 31, 1879; Private, Co. F, 48th Regt. (Thirty-eighth Separate Company), May 2, 1879; Corporal, July 26, 1881; Sergeant, April 25, 1883; First Sergeant, May 10, 1884; discharged, Sept. 2, 1884; First Lieutenant, Thirty-eighth Separate Company, July 12, 1886.	N. Y.
Second Lieutenant.			
.....	.....	.....	.....

THIRTY-NINTH SEPARATE COMPANY.

Fourth Brigade.

State Armory at Watertown, Jefferson county.

Captain.			
James R. Miller, Feb. 24, 1885	Sergeant, British Vols., 5th Lancashire Rifle vols. of Scotland.	Captain, Co. C, 35th Battallion, April 15, 1875; discharged May 12, 1881; Lieutenant-Colonel, 35th Battalion, July 5, 1881; Supernumerary, 1881; Captain, Thirty-ninth Separate Company, Feb. 24, 1885.	Scot.
First Lieutenant.			
William W. Scott, Feb. 24, 1885		Private, Co. C, 35th Battalion, April 19, 1875; Quartermaster-Sergeant; Second Lieutenant, July 27, 1878; First Lieutenant, May 31, 1881; resigned Sept. 27, 1884; First Lieutenant, Feb. 24, 1885.	N. Y.
Second Lieutenant.			
Thomas F. Kearns, May 31, 1881		Private, Co. C, 35th Battalion, Oct. 4, 1875; Sergeant, Feb. 14, 1877; First Sergeant, May 26, 1880; Second Lieutenant, May 31, 1881.	Can.
Assistant Surgeon—First Lieutenant.			
Mason L. Smith, Oct. 23, 1883		Private, Thirty-ninth Separate Company, March 7, 1882; First Lieutenant and Assistant Surgeon, Oct. 23, 1883.	N. Y.

FORTIETH SEPARATE COMPANY.

Fourth Brigade.

State Armory at Syracuse, Onondaga county.

Captain.			
Theodore M. Barber, October 16, 1877,	Private, 185th N. Y. Vols., Sept. 5, 1864; First Lieutenant, Sept. 19, 1864; Captain, Dec. 24, 1864; Lieutenant-Colonel, Feb. 3, 1865; discharged May 30, 1865.	Private, Co. A, 49th militia, 1851; Corporal, July 26, 1854; First Sergeant, Oct. 7, 1860; transferred to 51st militia in 1862; promoted First Sergeant, Sept. 6, 1862; Second Lieutenant, July 28, 1863; First Lieutenant, Feb. 9, 1864; discharged Oct. 6, 1864; Captain, Co. A, 51st Regt., Sept. 18, 1868; Supernumerary, 1872; Captain, Co. G, 51st Regt., (now 42d Separate Company), Oct. 16, 1877; Supernumerary, Feb. 15, 1883; Brevet Lieutenant-Colonel, Oct. 25, 1881; Captain, 40th Separate Company, June 7, 1887, with original rank.	N. Y.

INFANTRY — FORTIETH SEPARATE COMPANY — *(Continued)*.

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
First Lieutenant. James Myall, July 5, 1887		Private Co. D, 51st Regt., Oct. 6, 1863; Sergeant, Oct. 4, 1864; First Sergeant, Sept. 25, 1866; discharged Oct. 25, 1871; Private Co. G, 51st Regt., Oct. 15, 1881; Corporal, 42d Separate Company, Jan. 9, 1882; discharged Feb. 15, 1883; Private, 40th Separate Company, March 28, 1887; First Lieutenant, July 15, 1887.	Eng.
Second Lieutenant. George F. Chatterton, May 26, 1884		Private, Co. I, 51st Regt., Jan. 24, 1873; First Sergeant, Jan. 30, 1874; Second Lieutenant, Jan. 16, 1875; First Lieutenant, March 27, 1878; Captain, Dec. 5, 1878; Supernumerary, Jan. 2, 1879; Second Lieutenant, 40th Separate Company, May 26, 1884.	.....
Assistant Surgeon — First Lieutenant. Adelbert D. Head, May 12, 1883	Private, 1st N. Y. vol. eng., July 1, 1861; discharged Nov. 4, 1864.	First Lieutenant and Assistant Surgeon, 40th Separate Company, May 12, 1883.	N. Y.

FORTY-FIRST SEPARATE COMPANY.

Fourth Brigade.

State Armory at Syracuse, Onondaga county.

Captain. Welcome B. Randall, Feb. 17, 1882		Adjutant, 51st Regt., March 30, 1874; Captain, Co. D, 51st Regt., Jan. 15, 1878; discharged Nov. 9, 1881; Captain, Forty-first Separate Company, Feb. 17, 1882.	N. Y.

First Lieutenant.			
Mark J. Blakely, September 24, 1885..	Private, Co. E, 28th N. Y. vols., 1861; discharged, June 2, 1862; Private, Co. G, 97th N. Y. vols., Sept. 25, 1863; Principal Musician, April 25, 1865; discharged, July 18, 1865.	Private, Co. A, 29th Regt., Nov., 1870; transferred to 44th Battalion, 1874; First Lieutenant, Co. C, Aug. 24, 1876; resigned, May 23, 1877; Private, Co. D, 51st Regt., Dec., 1877; Second Lieutenant, March 5, 1878; First Lieutenant, June 7, 1878; resigned, Aug. 1878; Ordnance Sergeant, 51st Regt., Sept., 1878; Private, Co. B, 51st Regt., Dec. 19, 1879; Company Quartermaster Sergeant, same date; discharged, April 1882; Private, 41st Separate Company. Nov., 1882; First Sergeant, same date; discharged, Jan. 22, 1885; First Lieutenant, 40th Separate Company, Sept. 24, 1885; First Lieutenant, 41st Separate Co., April 22, 1887, with original rank.	N. Y.
Second Lieutenant.			
Alexander E. Oberlander, April 9, '85.	.....	Private, Forty-first Separate Company, March 13, 1883; Second Lieutenant, April 9, 1885.	N. Y.
Assistant Surgeon—First Lieutenant.			
Harry C. Baum, January 12, 1887.....	.....	First Lieutenant and Assistant Surgeon, 41st Separate Company, January 12, 1887.	N. Y.

Forty-second Separate Company.

Fourth Brigade.

Armory, Niagara Falls, Niagara county.

Captain.			
Charles B. Gaskill, Nov. 9, 1885.....	Private, 44th N. Y. vols., Oct., 1861; Second Lieutenant, Dec. 23, 1861; First Lieutenant, May 14, 1862; resigned, Dec. 18, 1862; Captain, 78th U. S. C. T., 1863; Major, 81st U. S. C. T., April 1, 1864; Lieutenant-Colonel and Colonel; resigned, Dec. 31, 1865; Captain, 40th U. S. infantry, July 28, 1866; transferred to 25th U. S. infantry, April 20, 1869; resigned, Dec. 1, 1870; Brevet Lieutenant-Colonel, U. S. A.	Captain, Forty-second Separate Company, Nov. 9, 1885.	N. Y.

INFANTRY—FORTY-SECOND SEPARATE COMPANY—*(Continued)*.

NAME, GRADE, AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
First Lieutenant. Lauren W. Pettebone, Nov. 9, 1885		First Lieutenant, Forty-second Separate Company, Nov. 9, 1885.	N. Y.
Second Lieutenant. Mighells B. Butler, Nov. 9, 1885		Second Lieutenant, Forty-second Separate Company, Nov. 9, 1885.	N. Y.
Assistant Surgeon—First Lieutenant. Edward H. Griswold, June 9, 1886		First Lieutenant and Assistant Surgeon, Forty-second Separate Company, June 9, 1886.	Conn

FORTY-THIRD SEPARATE COMPANY.

Fourth Brigade.

Armory, Olean, Cattaraugus county; organized by S. O. No. 24, A. G. O., March 17, 1887.

Captain. ulver Gilman Thyng, March 17, 1887,		Captain, Forty-third Separate Company, March 17, 1887.	N. Y.
First Lieutenant. Henry Fred. Lee, March 17, 1887		Drummer, N. G. Pa., 1876 and 1877; Private Co. A, 16th Regt., N. G. Pa., April 24, 1878; discharged, June 24, 1882; First Lieutenant, Forty-third Separate Company, March 17, 1887.	N. Y.
Second Lieutenant. Wilbert H. Carringer, March 17, 1887,		Second Lieutenant, Forty-third Separate Company, March 17, 1887.	Pa.
First Lieutenant—Assistant Surgeon. Selden Johnson Mudge, April 12, 1887,		Assistant Surgeon, Forty-third Separate Company, April 12, 1887.	N. Y.

Forty-fourth Separate Company.

Third Brigade.

Armory, Utica, Oneida county; organized by S. O. No. 82, *A. G. O., September* 13, 1887.

Captain. Daniel T. Everts, Sept. 27, 1887		Captain, Forty-fourth Separate Company, Sept. 27, 1887.	N. Y.
First Lieutenant. John Cummings, Jr., Sept. 27, 1887		First Lieutenant, Forty-fourth Separate Company, Sept. 27, 1887.	Ont.
Second Lieutenant. Edmond A. O'Brien, Sept. 27, 1887		Second Lieutenant, Forty-fourth Separate Company, Sept. 27, 1887.	N. Y.

SUPERNUMERARY OFFICERS ASSIGNED TO ACTIVE DUTY.

NAME, GRADE AND DATE OF RANK.	SERVICE.		Born.
	In the Armies of the United States.	In the National Guard.	
Colonel.			
David M. Greene, Oct. 6, 1873	Third Assistant Engineer, U. S. N., May 21, 1861; Second Assistant Engineer, Oct. 29, 1862; First Assistant Engineer, April 11, 1865; resigned, Sept., 1869.	Colonel and Engineer, Third Division, Oct. 6, 1873; Supernumerary, Aug. 5, 1886; assigned to duty with 3d Brigade as Engineer, Oct. 26, 1886.	N. Y.
Lieutenant-Colonels.			
Charles Clifton, April 22, 1884		First Lieutenant and Aide-de-Camp, 14th Brigade, April 16, 1881; Captain and Quartermaster, July 19, 1881; Major and Quartermaster, 8th Brigade, April 23, 1883; Lieutenant-Colonel and Assistant Adjutant-General, April 22, 1884; Supernumerary, Aug. 5, 1886; Assistant Adjutant-General, 4th Brigade, with original rank, Sept. 7, 1886; Supernumerary, and assigned to duty with 4th Brigade, Nov. 8, 1886.	N. Y.
Benjamin S. Church, Dec. 8, 1884		Captain and Engineer, 12th Regt., N. Y. S. Militia, Nov. 26, 1860; Major and Inspector, 2d Brigade, Dec. 17, 1864; Major and Engineer, Oct. 29, 1867; discharged, Feb. 1, 1868; Lieutenant-Colonel and Engineer, First Division, Dec. 8, 1884; Supernumerary, Aug. 5, 1886, and assigned to duty with 1st Brigade as Engineer, Sept. 17, 1886.	N. Y.
Majors.			
Frederick B. Spriggs, April 23, 1883		Captain and Aide-de-Camp, Aug. 31, 1878; Captain and Commissary of Subsistence, Aug. 24, 1880; Major and Commissary of Subsistence, April 23, 1883; Supernumerary, Aug. 5, 1886; assigned to duty with 3d Brigade, Oct. 15, 1886.	.....

Edward L. Gaul, April 24, 1883	Captain's clerk, U. S. Navy, April, 1861, to Feb., 1862; Captain, Co. A, 159th N. Y. vols., Sept. 11, 1862; Major, April 14, 1863; Lieutenant-Colonel, Jan. 10, 1864; discharged for disability, June 2, 1864.	Major and Aide-de-Camp, Third Division, April 24, 1883; Supernumerary, Aug. 5, 1886; assigned to duty with 3d Brigade, Oct. 15, 1886.	N. Y.
Edmund C. Stanton, June 22, 1885		First Lieutenant and Aide-de-Camp, 1st Brigade, May 19, 1880; resigned July 22, 1880; Captain and Assistant Signal Officer, 1st Brigade, Nov. 1, 1884; Major and Quartermaster, 1st Brigade, Jan. 22, 1885; Supernumerary, Aug. 5, 1886; assigned to duty with 1st Brigade, Dec. 6, 1886.	Conn
Captains.			
James M. Brady, Dec. 27, 1871		Captain, Co. C, 12th Regt., Dec. 27, 1871; Supernumerary, by disbandment, Jan. 12, 1876; assigned to duty with 12th Regt., Jan, 28, 1886,	.....
G. Henry Witthaus, March 1, 1879		Private, Co. B, 9th Regt., Nov, 1, 1877; Captain, I. R. P., March 1, 1879; rendered Supernumerary, June 4, 1886; assigned to duty with 9th Regt., Jan. 22, 1887; S. O., No. 4, § 5, A. G. O.	N. Y.
Frederick T. Leigh, May 8, 1886		Captain and Assistant Signal Officer, 2d Division, May 8, 1886; Supernumerary, Aug. 5, 1886; assigned to duty as Signal Officer, 2d Brigade, S. O. No. 86, A. G. O., Oct. 5, 1887.	.....

SUPERNUMERARY OFFICERS.

Supernumerary Officers failing to report in writing in the month of January, each year, to the Adjutant-General are dropped from the Register.

NAME, GRADE AND DATE OF RANK.	RETIRED OR RENDERED SUPERNUMERARY.		Residence.
	From which Organization.	When.	
Major-Generals.			
Farnsworth, J. G., January 1, 1883	Adjutant-General	December 31, 1885	Albany.
Husted, James W., March 26, 1873	Fifth Division	December 17, 1881	Peekskill.
Rogers, William Findlay, January 21, 1879	Fourth Division	August 5, 1886	Buffalo.
Brigadier-Generals.			
Beers, Edmund O., October 25, 1884	Seventh Brigade, Fourth Division	August 5, 1886	Elmira.
Briggs, Philip H., January 1, 1883	Inspector-General	December 31, 1885	Brooklyn.
Dering, Sylvester, May 12, 1863	Sixth Brigade, Third Division	August 5, 1886	Syracuse.
Sullivan, T., July 29, 1872	Sixth Brigade, Sixth Division	December 17, 1881	Oswego.
Ward, Rodney C., February 25, 1886	Fourth Brigade, Second Division	August 5, 1886	Brooklyn.
Ward, William Green, December 24, 1866	First Brigade, First Division	August 5, 1886	New York city.
Colonels.			
Bridge, Charles E., January 1, 1883	Assistant Quartermaster-General	December 29, 1885	Brooklyn.
Burton, Matthew H., April 21, 1876	Surgeon, Third Division	August 5, 1886	Troy.
Chamberlin, Lee, November 5, 1869	Asst. Adjt.-General, Third Division,	August 5, 1886	Troy.
Denslow, William Judd, Nov. 24, 1884	Inspector, Second Brigade	June 21, 1887	Brooklyn.
Depew, Chauncey M., July 7, 1873	Judge-Advocate, Fifth Division	December 17, 1881	Peekskill.
Gildersleeve, Henry A., October 5, 1874	Asst. Adjt.-General, First Division	August 5, 1886	New York city.
Houghton, Calvin V., August 16, 1880	Forty-eighth Regiment	December 17, 1881	Oswego.
Jussen, Carl, October 7, 1874	Inspector, First Division	August 5, 1886	New York city.
Lamont, Daniel S., January 1, 1883	Military Secretary	January 5, 1885	Washington, D.C.
Lindley, Alfred F., March 9, 1876	Twenty-first Regiment	December 17, 1881	Poughkeepsie.
Mullin, Joseph, November 16, 1874	Inspector, Fourth Division	August 23, 1878	Watertown.
Reichert, Louis P., May 6, 1878	Seventy-fourth Regiment	March 9, 1883	Buffalo.
Rice, William G., February 17, 1875	Assistant Paymaster-General	March 2, 1885	Albany.
Rockwood, Ebenezer Arthur, April 22, 1881	Asst. Adjt.-General, Fourth Division,	August 19, 1884	Buffalo.

Rounds, Edward H., July 7, 1885	Asst. Adjt.-General, Fourth Division,	August	5, 1886	Buffalo.
Van Brackle, C. H., January 10, 1877	Asst. Adjt.-General, Fourth Division,	July	25, 1878	Watertown.
Van Wyck, William E., August 5, 1875	Asst. Adjt.-Gen. 2d Brig. Sup'y Officer	September	6, 1880	New York city.
Vose, Richard, September 11, 1872	Seventy-first Regiment	December	19, 1884	New York city.
Ward, John J., January 4, 1867	Twelfth Regiment	October	16, 1877	New York city.
Lieutenant Colonels.				
Alden, Henry M., October 15, 1874	Ordnance Officer, Third Division	August	5, 1886	Troy.
Boughton, Wm. De Lancey, June 23, 1882	Ordnance Officer, First Division	August	5, 1886	New York city.
Burton, Wingfield G., January 12, 1880	Assistant in Ordnance Department	December	19, 1885	
Cooke, Edward A., November 27, 1872	Asst. Adjt.-Gen., 6th Brig., 6th Div.	December	17, 1881	Oswego.
Cooley, Alfred, October 9, 1874	Sixteenth Battalion	December	17, 1881	Mt. Vernon.
Cowan, John F., November 24, 1884	Ordnance Officer, Second Division	August	5, 1886	Brooklyn.
Cropsey, Athelbert, August 16, 1880	Forty-eighth Regiment	December	17, 1881	Oswego.
David, Albert L., June 12, 1883	Assistant in Depart. Rifle Practice	December	12, 1887	New York city.
Edson, Cyrus, January 6, 1883	Surgeon, First Division	August	5, 1886	New York city.
Francis, Charles Spencer, May 1, 1884	Inspector, Third Division	August	5, 1886	Troy.
Gillis, George H., April 24, 1883	Chief of Artillery, Third Division	August	5, 1886	Troy.
Hayt, Edward D. (Brev. Col.), Aug. 27, 1878	Seventeenth Battalion	December	17, 1881	Newburgh.
Hick, William H., March 23, 1886	Inspector Rifle Practice, Fourth Div.	August	5, 1886	Buffalo.
Keep, J. Lester (Brev. Col.), March 12, 1883	Surgeon, Second Division	November	19, 1884	Brooklyn.
King, William H., August 5, 1875	Sixth Regiment	September	6, 1880	Albany.
Knapp, Louis H., June 3, 1882	Engineer, Fourth Division	August	5, 1886	Buffalo.
Krank, George, August 15, 1877	Twenty-fifth Regiment	February	12, 1881	Albany.
Lawrence, Abram B., January 2, 1883	Ordance Officer, Fourth Division	August	5, 1886	Warsaw.
Lewis, George H., July 7, 1885	Com'sary of Subsistence, Fourth Div.	August	5, 1886	Buffalo.
Masters, Hilbert B., December 8, 1884	Com'sary of Subsistence, First Div.	August	5, 1886	New York city.
Mather, Andrew E., January 1, 1880	Asst. Adjt.-General, Fifth Brigade	July	14, 1883	Albany.
Middleton, Clifford L., April 19, 1886	Asst. Adjt.-General, Fourth Brigade,	August	5, 1886	Brooklyn.
Mitchell, Edward, September 24, 1881	Judge Advocate, First Division	August	5, 1886	New York city.
Olyphant, Rob. (Brev. Brig.-Gen), Dec. 18, 1880	Asst. Adjt.-General, First Brigade	August	5, 1886	New York city.
Overton, William B., May 26, 1880	Com'sary of Subsistence, Second Div.	November	22, 1884	Brooklyn.
Palmer, Charles N., October 27, 1879	Surgeon, Fourth Division	August	5, 1886	Buffalo.
Phillips, Lewis F., April 28, 1877	Insp. of Rifle Practice, Fourth Div.	July	25, 1878	Watertown.
Robb, J. Hampden, May 7, 1883	Asst. Adjt.-General, Second Brigade,	August	5, 1886	New York city.
Robson, Benjamin R., March 23, 1870	Asst. Adjt.-General, Sixth Brigade	August	5, 1886	Utica.
Roullier, Gustave A., November 24, 1884	Insp. of Rifle Practice, Second Div.	August	5, 1886	Brooklyn.
Sanford E. Harrison, February 20, 1877	Insp. of Rifle Practice, First Div.	August	5, 1886	New York city.
Schoeffel, Francis A., April 20, 1877	Asst. Adjt.-Gen'l, 12th Brig., 7th Div.	November	24, 1880	Rochester.

SUPERNUMERARY OFFICERS, N. G. S. N. Y. — *(Continued).*

NAME, GRADE AND DATE OF RANK.	RETIRED OR RENDERED SUPERNUMERARY.		Residence.
	From which Organization.	When.	
Lieutenant-Colonels — (Continued).			
Sourwine, Daniel, September 22, 1885	Chief of Artillery, Fourth Division	August 5, 1886	Buffalo.
Storey, J. Henry, March 15, 1880	Inspector, Second Division	November 19, 1884	Brooklyn.
Van Keuren, John A., February 11, 1875	Asst. Adjt.-Gen'l, 8th Brig., 5th Div.	December 17, 1881	Poughkeepsie.
Webber, Abraham L., December 10, 1879	Fifth Regiment	December 17, 1881	New York city.
Wood, Edward T., December 16, 1882	Quartermaster, First Division	August 5, 1886	New York city.
Wray, A. H., June 4, 1877	Ordnance Officer, Fourth Division	July 9, 1878	Watertown.
Majors.			
Ackerman, Howard, December 8, 1884	Ordnance Officer, Third Brigade	August 5, 1886	Brooklyn.
Aspinwall Lloyd, Jr., October 25, 1883	Insp. of Rifle Prac., First Brigade	August 5, 1886	New York.
Bacon, James, December 6, 1884	Insp. of Rifle Prac., Seventh Brigade	August 5, 1886	Syracuse.
Banks, Robert Lenox, Jr., March 17, 1886	Quartermaster, Fifth Brigade	August 5, 1886	Albany.
Bishop, Edwin F., April 13, 1886	Aide-de-Camp, Fourth Division	August 5, 1886	Buffalo.
Broun, Heywood C. December 8, 1884	Insp. of Rifle Prac., Third Brigade	August 5, 1886	Brooklyn.
Brown, Herbert P., August 10, 1885	Commissary of Subsist., First Brig.	August 5, 1886	New York city.
Burton, John E., May 21, 1880	Tenth Regiment	February 17, 1881	Kansas City, Mo.
Bush, Robert P., December 6, 1884	Surgeon, Seventh Brigade	August 5, 1886	Elmira.
Clarke, H. Wadsworth, October 28, 1879	Fifty-first Regiment	December 17, 1881	Syracuse.
Coburn, John W., March 10, 1876	Twenty-seventh Regiment	November 22, 1878	New York city.
Cowdin, John Elliott, February 6, 1884	Ordnance Officer, First Brigade	August 5, 1886	New York city.
Denton, Julius S., December 6, 1884	Ordnance Officer, Seventh Brigade	August 5, 1886	Elmira.
Earle, Eugene M., May 6, 1875	Engineer, Second Brigade	September 6, 1880	New York city.
Eaton, J. Emory, April 23, 1883	Quartermaster, Sixth Brigade	August 5, 1886	Utica
Elsworth, Edward, March 24, 1875	Judge-Advocate, Eighth Brigade	December 17, 1881	Poughkeepsie.
Everett, Charles J., January 14, 1878	Judge-Advocate, Sixth Brigade	August 5, 1886	Utica.
Gedney, Frederick G., January 17, 1881	Fifth Regiment	December 17, 1881	New York city.
Goodrich, Wm. W., January 2, 1883	Judge-Advocate, Fourth Brigade	August 5, 1886	Brooklyn.
Handy, Isaac F. (Brev. Lieut.-Colonel), June 17, 1871	Aide-de-Camp, Third Division	July 11, 1881	Troy.
Herbert, George R., December 15, 1884	Aide-de-Camp, Second Division	August 5, 1886	Brooklyn.

Herbert, Robert, March 15, 1880	Aide-de-Camp, Second Division	August 5, 1886	Brooklyn.
Howard, Henry W. B., November 22, 1884	Aide-de-Camp, Second Division	August 5, 1886	Brooklyn.
Ives, Hugh M., November 3, 1876	Surgeon, Sixteenth Battalion	December 17, 1881	Oneonta.
Johnson, Richard M., December 8, 1884	Inspector, Third Brigade	August 5, 1886	Brooklyn.
Koch, Joseph, October 27, 1879	Judge-Advocate, Second Brigade	September 6, 1880	New York city.
Luckey, R. Livingston (Brev. Lieut.-Col.), September 8, 1875	Inspector, Seventh Brigade	December 17, 1881	New York city.
McArthur, Arthur, July 11, 1881	Aide-de-Camp, Third Division	August 5, 1886	Troy.
Morgan, Wm. Fellows, June 22, 1885	Engineer, First Brigade	August 5, 1886	New York city.
Morse, G. Livingstone, July 5, 1879	Insp. of Rifle Prac., Seventh Brig.	December 17, 1881	New York city.
Murray, Francis Wisner, February 11, 1885	Surgeon, First Brigade	August 5, 1886	New York city.
Perrine, Howland D., May 8, 1886	Chief Signal Officer, Second Division	August 5, 1886	Brooklyn.
Poillon, Richard H., September 17, 1879	Engineer, Fourth Brigade	August 5, 1886	Brooklyn.
Pomeroy, Dexter E., March 23, 1880	Insp. of Rifle Prac., Sixth Brigade	August 5, 1886	Utica.
Powell, Seneca D., March 10, 1875	Surgeon, Second Brigade	September 6, 1880	New York city.
Randall, Walter F., May 1, 1885	Engineer, Sixth Brigade	August 5, 1886	Utica.
Read, Harmon P., March 1, 1886	Insp. of Rifle Prac., Fifth Brigade	August 5, 1886	Albany.
Rockwell, Hosea H., December 6, 1884	Judge-Advocate, Seventh Brigade	August 5, 1886	Elmira.
Scott, David, March 3, 1877	Inspector, Second Brigade	September 6, 1880	New York city.
Sherrill, Lewis T., October 8, 1883	Inspector, Sixth Brigade	August 5, 1886	Utica.
Spawn, Jacob, April 20, 1877	Engineer, Twelfth Brigade	April 2, 1880	Rochester.
Stearns, Edson J., December 6, 1884	Com'sary of Subsist., Seventh Brig.	August 5, 1886	Syracuse.
Terry, Marshall O., March 15, 1880	Surgeon, Sixth Brigade	August 5, 1886	Utica.
Theall, John H., December 7, 1875	Fiftieth Battalion	November 22, 1878	Enfield Centre.
Vought, W. G., July 7, 1885	Com'sary of Subsist., Eighth Brig.	August 5, 1886	Buffalo.
Ward, Samuel B., July 11, 1878	Surgeon, Fifth Brigade	August 5, 1886	Albany.
Webb, Francis Egerton, November 14, 1885	Inspector, First Brigade	August 5, 1886	New York city.
Woodward, James O., May 13, 1885	Ordnance Officer, Fifth Brigade	August 5, 1886	Albany.
Captains.			
Adriance, I. Reynolds, February 11, 1875	Aide-de-Camp, Eighth Brig., 5th Div.	December 17, 1881	Poughkeepsie.
Allen, Flavius J., October 10, 1877	Aide-de-Camp, Second Brig., 1st Div.	November 24, 1880	New York city.
Anhalt, Abraham, July 21, 1881	Fifth Regiment	December 17, 1881	New York city.
Baker, Guy E., September 1, 1885	Aide-de-Camp, Fifth Brigade	August 5, 1886	Albany.
Bissell, Henry F., February 25, 1878	Battery "D"	December 17, 1881	Poughkeepsie.
Boshart, William F., June 7, 1875	Twenty-first Regiment	December 17, 1881	Poughkeepsie.
Callahan, John J., Jr., November 18, 1879	Sixty-fifth Regiment	January 24, 1883	Buffalo.
Cushing, William (Brevet Major), Oct. 29, 1869,	Sixty-ninth Regiment	December 6, 1884	New York city.
Cushman, Harry C., January 31, 1883	Aide-de-Camp, Fifth Brigade	August 5, 1886	Albany.

SUPERNUMERARY OFFICERS, N. G. S. N. Y.—*(Continued).*

NAME, GRADE AND DATE OF RANK.	RETIRED OR RENDERED SUPERNUMERARY.		Residence.
	From which Organization.	When.	
Captains—(Continued).			
D'Oremieulx, Leon F., November 14, 1885	Aide-de-Camp, First Brigade	August 5, 1886	New York city.
Dorn, George W., Nov. 7, 1879	Troop "F"	December 28, 1880	Albany.
Gardner, Henry J., October 31, 1881	Aide-de-Camp, Sixth Brig., 6th Div.	December 17, 1881	Oswego.
Gerner, Joseph H., May 12, 1885	Twenty-fourth Separate Company	March 2, 1887	Utica.
Hacker, Adam, April 1, 1880	Twenty-fifth Regiment	February 12, 1881	Albany.
Hall, Albert C., October 10, 1877	Quartermaster, Second Brig., 1st Div.	September 6, 1880	New York city.
Hart, Charles L., December 6, 1884	Aide-de-Camp, Seventh Brigade	August 5, 1886	Elmira.
Haubennestel, Henry, July 5, 1877	Twenty-first Regiment	December 17, 1881	Poughkeepsie.
Herbold, Julius T., May 28, 1881	Sixth-fifth Regiment	October 20, 1887	Buffalo.
Hornbeck B. J., November 8, 1877	Fourteenth Separate Company	December 28, 1887	Kingston.
Hornbostel, Andrew, March 2, 1881	Fifth Regiment	December 17, 1881	New York city.
Jones, Abram, March 18, 1874	Sixteenth Battalion	December 17, 1881	Sing Sing.
Knapp, Henry J., June 4, 1878	Fifty-first Regiment	December 17, 1881	Fayetteville.
Lambart, Frederick, October 2, 1871	Twenty-seventh Regiment	November 22, 1878	New York city.
L'Hommedieu, R. W., January 20, 1866	Sixteenth Regiment	June 5, 1868	Brooklyn.
McAndrews, John H., June 25, 1879	Seventy-fourth Regiment	December 17, 1881	Buffalo.
Menker, Henry A., September 18, 1876	Inspector of Rifle Practice, 65th Regt.	November 1, 1887	Buffalo.
Milbank, William E., July 13, 1880	Inspector of Rifle Practice, 10th Batt.	October 13, 1883	Albany.
Morgan, George, Jr., December 13, 1870	Seventy-fourth Regiment	December 17, 1881	Buffalo.
Muldoon, John, July 17, 1872	Fifty-first Regiment	December 17, 1881	Syracuse.
Munson, David W., December 6, 1884	Aide-de-Camp, Seventh Brigade	August 5, 1886	Elmira.
Porter, Joseph H., September 2, 1875	Twenty-seventh Regiment	November 22, 1878	New York city.
Romain, Frank H., April 20, 1885	Aide-de-Camp, Third Brigade	August 5, 1886	Brooklyn.
Scott, George, September 25, 1884	Assistant Surgeon, 71st Regiment	March 27, 1885	New York city.
Sharp, James E. September 17, 1885	Fourth Battery	February 16, 1887	Troy.
Stierly, Robert S., December 12, 1876	Battalion of Artillery	September 4, 1880	Rochester.
Tallman, John C. C., January 22, 1872	Ninth Regiment	February 29, 1884	New York city.
Trimble, Walter, October 25, 1883	Aide-de-Camp, First Brigade	August 5, 1886	New York city.
Watson, William L., April 23, 1883	Aide-de-Camp, Sixth Brigade	August 5, 1886	Utica.
Webb, William E., October 10, 1877	Ordnance Officer, 2d Brig., 1st Div.	September 6, 1880	New York city.

Wood, Henry G., July 26, 1875	Third Separate Company	August 26, 1886	New York city.
First Lieutenants.			
Britton, Reuben A. (Brev. Cap.), March 29, 1879.	Quartermaster, Ninth Regiment	December 7, 1885	New York city.
Cavana, Martin, December 17, 1881	Thirty-fifth Separate Company	February 20, 1882	Oneida.
De Lacey, William L., April 5, 1878	Battery "D"	December 17, 1881	Poughkeepsie.
Dunscomb, John A., December 1, 1877	Adjutant, Sixteenth Battalion	December 17, 1881	Sing Sing.
Ernst, Louis J., April 12, 1878	Quartermaster, Fifty-fourth Regt.	December 10, 1880	Rochester.
Fichtner, David E., July 1, 1879	Battalion of Artillery	September 4, 1880	Rochester.
Girvin, Thomas, Jr., June 11, 1869	Seventy-first Regiment	July 17, 1875	New York city.
Loeper, C. O. H. (Brev. Cap.), Feb. 29, 1868	Adjutant, Twenty-fifth Regiment	December 17, 1881	Albany.
Manning, James H., March 15, 1878	Com'sary of Subsist., Tenth Batt.	October 13, 1883	Albany.
Ryder, William W., April 4, 1878	Sixteenth Battalion	December 17, 1881	Sing Sing.
Sexton, Samuel, September 17, 1885	Fourth Battery	February 16, 1887	Troy,
Smith, Peter J., December 12, 1876	Battery "I"	September 4, 1880	Rochester.
Tillinghast, John M., June 26, 1884	Twenty-fourth Separate Company	March 2, 1887	Utica.
Windholz, Louis, September 26, 1878	Com'sary of Subsist., Fifty-first Regt.	December 17, 1881	Syracuse.
Wyckoff, Albert T., May 8, 1872	Seventh Regiment	February 18, 1884	Long Island City.
Wynan, Isaac L., May 3, 1880	Com'sary of Subsist., Fifth Regt.	December 17, 1881	New York city.
Second Lieutenants.			
Heidel, Joseph, March 21, 1878	Twenty-first Regiment	December 17, 1881	Poughkeepsie.
Jewett, Gilbert W., July 19, 1880	Fourth Battery	February 16, 1887	Troy.
Merritt, Graham B., July 29, 1879	Sixteenth Battalion	December 17, 1881	Sing Sing.
O'Connor, Jeremiah, December 22, 1885	Twenty-fourth Separate Company	March 2, 1887	Utica.
Satterlee, Nelson R., December 17, 1879	Thirty-fifth Separate Company	February 20, 1882	Oneida.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE.

(GENERAL OFFICERS AND STAFF OF COMMANDER-IN-CHIEF EXCEPTED.)

Number.	NAME AND DATE OF RANK.	Organization.
	Colonels.	
1	Emmons Clark, June 21, 1864	Seventh Regiment.
2	James Cavanaugh, Nov. 29, 1867	Sixty-ninth Regiment
3	George D. Scott, October 18, 1869	Eighth Regiment.
4	David M. Greene, October 6, 1873	Engineer, Third Brigade.
5	David E. Austen, July 13, 1877	Thirteenth Regiment.
6	John S. McEwen, January 1, 1880	Assist. Adjutant-Gen. S.N.Y.
7	Frederick Phisterer, January 1, 1880	Act. Asst. Adjt.-Gen. S. N. Y.
8	Joseph G. Story, January 20, 1880	Assistant in Ordnance Dep't.
9	Louis Finkelmeier, October 8, 1881	Thirty-second Regiment.
10	William Seward, Jr., April 17, 1882	Ninth Regiment.
11	John Bodine, January 1, 1883	Assist. Gen. Insp. Rifle Prac.
12	William M. Bloomer, April 10, 1883	Seventy-fourth Regiment.
13	James H. Jones, December 12, 1883	Twelfth Regiment.
14	Pascal P. Beals, January 8, 1884	Assist. in Dep't Rifle Prac.
15	Thomas H. McGrath, Feb. 7, 1884	Assistant Inspector-General.
16	Edward F. Gaylor, July 2, 1884	Forty-seventh Regiment.
17	Edward B. Ten Broeck, March 21, 1885,	Assist. Paymaster-General.
18	Albert P. Stewart, June 1, 1885	Eleventh Regiment.
19	Harry W. Michell, Nov. 30, 1885	Fourteenth Regiment.
20	Wm. H. Brownell, Jan. 7, 1886	Assist. Chief of Ordnance.
21	John T. Camp, January 18, 1886	Twenty-second Regiment.
22	Henry F. Clark, January 26, 1886	Asst. Quartermaster-Gen'l.
23	Frank S. Collins, March 29, 1886	Asst. Chief of Ordnance.
24	Frederick Kopper, July 19, 1887	Seventy-first Regiment.
25	Samuel M. Welch, August 10, 1887	Sixty-fifth Regiment.
26	John N. Partridge, October 17, 1887	Twenty-third Regiment.
	Lieutenant-Colonels.	
1	Francis A. Shilling, Dec. 14, 1870	Eighth Regiment.
2	Wm. DeLacey, August 9, 1877	Sixty-ninth Regiment.
3	George Moore Smith, March 5, 1881	Seventh Regiment.
4	John B. Frothingham, April 11, 1881	Asst. Adjt-Gen., Second Brig.
5	Usual S. Johnson, May 14, 1883	Seventy-fourth Regiment.
6	William E. Fitch, August 22, 1883	Tenth Battalion.
7	Thomas B. Rand, Feb. 5, 1884	Ninth Regiment.
8	Charles Clifton, April 22, 1884	Super., on duty, Fourth Brig.
9	Frederick S. Benson, Nov. 19, 1884	Forty-seventh Regiment.
10	Benjamin S. Church, Dec. 8, 1884	Engineer, First Brigade.
11	Heman Dowd, April 29, 1885	Twelfth Regiment.
12	William P. Walton, Sept. 9, 1885	Eleventh Regiment.
13	Selden C. Clobridge, Nov. 30, 1885	Fourteenth Regiment.
14	Frederick C. McLewee, Jan. 12, 1886	Assistant Inspector-General.
15	William J. Harding, Feb. 8, 1886	Twenty-second Regiment.
16	William W. Ladd, Jr., Feb. 25, 1887	Asst. Judge Advocate-Gen.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued)*.

Number.	NAME AND DATE OF RANK.	Organization.
	Lieutenant-Colonels —(Continued).	
17	John E. Robie, Sept. 15, 1887	Sixty-fifth Regiment.
18	James A. Dennison, Sept. 15, 1887	Seventy-first Regiment.
19	Robert W. Leonard, Oct. 6, 1887	Asst. Adjt-Gen., First Brig.
20	Alexis C. Smith, Dec. 5, 1887	Twenty-third Regiment.
	Majors.	
1	Gregory Doyle, June 1, 1872	Sur., Fifth Bat. of Artillery.
2	Edward Duffy, March 16, 1876	Sixty-ninth Regiment.
3	Stephen W. Roof, Nov. 27, 1876	Surgeon, Ninth Regiment.
4	Lewis Balch, July 23, 1877	Surgeon, Tenth Batallion.
5	Charles H. Stott, Jr., May 18, 1880	Quartermaster, Third Brig.
6	Stephen H. Olin, April 24, 1882	Judge Advocate, First Brig.
7	Chas. L. Perkins, Jr., May 22, 1882	Com. of Subsist., First Brig.
8	Albert Hoysradt, January 31, 1883	Judge Advocate, Third Brig.
9	Robert V. McKim, March 5, 1883	Surgeon, First Brigade.
10	Charles G. Stockton, April 23, 1883	Sur.g, Seventy-fourth Regt.
11	Frederick B. Spriggs, April 23, 1883	On duty with Third Brigade.
12	Gustave A. Jahn, April 23, 1883	Inspector, Second Brigade.
13	Albert H. Briggs, April 23, 1883	Surgeon, Sixty-fifth Regt.
14	Edward H. Ashwin, April 23, 1883	Surgeon, Forth-seventh Reg.
15	John F. Valentine, April 23, 1883	Surgeon, Thirty-second Reg.
16	Daniel M. Stimson, April 23, 1883	Surgeon, Seventh Regiment.
17	Charles E. Bruce, April 23, 1883	Surgeon, Eighth Regt.
18	William F. Duncan, April 23, 1883	Sur., Twenty-second Regt.
19	Edward L. Gaul, April 24, 1883	On duty with Third Brigade.
20	Paul Dana, May 7, 1883	Ordnance Officer, First Brig.
21	Wolfgang Goetz, Nov. 19, 1883	Surgeon, Eleventh Regt.
22	John J. Riker, January 9, 1884	Twelfth Regiment.
23	Clifford A. H. Bartlett, Feb. 5, 1884	Ninth Regiment.
24	A. W. Ford, April 8, 1884	Surgeon, Sixth-ninth Regt.
25	Edward S. Warren, April 22, 1884	Quartermaster, Fourth Brig.
26	Edmund Hayes, April 22, 1884	Engineer, Fourth Brigade.
27	Roswell Park, May 6, 1884	Surgeon, Fourth Brigade.
28	Auguste P. Montant, May 14, 1884	Quartermaster, First Brig.
29	Allen H. G. Hardwicke, June 3, 1884	I. R. P., Fourth Brig.
30	John G. Eddy, Nov. 19, 1884	Forty-seventh Regiment.
31	George L. Fox, Jan. 19, 1885	I. R. P., Second Brigade.
32	Nelson H. Henry, Jan. 23, 1885	Surgeon, Twelfth Regiment.
33	Wendell Goodwin, Feb. 28, 1885	Quartermaster, First Brig.
34	Edward T. T. Marsh, March 4, 1885	Surgeon, Seventy-first Regt.
35	J. Fred. Ackerman, March 27, 1885	Thirteenth Regiment.
36	Chas. E. De LaVergne, June 18, 1885	Surgeon, Thirteenth Regt.
37	Edmund C. Stanton, June 22, 1885	Sup. Officer on duty, 1st Brig.
38	Frank A. Jones, August 21, 1885	Eleventh Regiment.
39	Herbert P. Bissell, August 25, 1885	Judge Ad., Fourth Brigade.
40	John McNeill. Nov. 30, 1885	Fourteenth Regiment.
41	Wm. Cary Sanger, Jan. 4, 1886	Quartermaster, Second Brig.
42	Frank Lyman, Jan. 4, 1886	Engineer, Second Brigade.
43	George A. Davis, Jan. 4, 1886	Seventy-fourth Regiment.
44	Norton Chase, February, Feb. 18, 1886	Tenth Battalion.
45	George A. Miller, March 5, 1886	Twenty-second Regiment.
46	Charles E. Waters, April 19, 1886	Twenty-third Regiment.
47	William H. Kipp, May 10, 1886	Seventh Regiment.
48	George Kinkel, Jr., May 17, 1886	Ord. Officer, Second Brigade.
49	George R. Fowler, June 2, 1886	Surgeon, Second Brigade.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued)*.

Number.	NAME AND DATE OF RANK.	Organization.
	Majors — (Continued).	
50	Henry Chauncey, Jr., Sept. 6, 1886	Eighth Regiment.
51	Edward O. Roessle, Sept. 8, 1886	Com. of Subsist., Third Brig.
52	Herman Bendell, Sept. 8, 1886	Surgeon, Third Brigade.
53	Patrick F. Bulger, Sept. 8, 1886	Ord. Officer, Third Brigade.
54	Charles H. Gaus, Sept. 10, 1886	I. R. P., Third Brigade.
55	Almet F. Jenks, October 4, 1886	Judge Ad., Second Brigade.
56	Clarence H. Eagle, Nov. 30, 1886	I. R. P. First Brigade.
57	J. Freeman Atwood, Jan. 3, 1887	Surgeon, Fourteenth Regt.
58	Frederick A. Jewett, March 15, 1887	Ord. Officer, Fourth Brigade.
59	Wallace A. Downs, April 19, 1887	Seventy-first Regiment.
60	Nathaniel Rochester, April 26, 1887	Inspector, Fourth Brigade.
61	Fritz Brosé, July 5, 1886	Com. of Sub., Second Brig.
62	Edson J. Weeks, Oct. 18, 1887	Com. of Sub., Fourth Brig.
63	John T. Parsons, Oct. 27, 1887	Sixty-fifth Regiment.
64	William E. Spencer, Nov. 28, 1887	Surgeon, Twenty-third Regt.
	Captains.	
1	Frederick Klonz, October 30, 1862	Eleventh Regiment.
2	Michael Bennan, May 10, 1865	Sixty-ninth Regiment.
3	Henry B. Henderson, July 12, 1865	Eighth Separate Company.
4	Ramon Cardona, July 17, 1865	I. R. P., Fourteenth Regt.
5	William C. Clark, Nov. 14, 1865	Seventy-first Regiment.
6	D. Alonzo Pollard, April 5, 1866	Seventh Regiment.
7	William Haubennestel, Nov. 12, 1866	Nineteenth Separate Co.
8	John Kerr, January 29, 1869	Sixty-ninth Regiment.
9	Alfred A. Doughty, May 25, 1869	Forty-seventh Regiment.
10	Michael Auer, April 6, 1870	Fifth Battery.
11	James M. Brady, Dec. 27, 1871	Supernum'ary, with 12th Reg.
12	Benjamin S. Steen, Nov. 22, 1872	Fourteenth Regiment.
13	Charles S. Burns, Dec. 6, 1872	Twelfth Regiment.
14	Joseph H. Remmer, June 3, 1873	Twenty-eighth Separate Co.
15	Laurel L. Olmstead, Nov. 13, 1874	Sixth Battery.
16	Hugh Coleman, Jan. 4, 1875	Sixty-ninth Regiment.
17	Edward Barker, May 3, 1875	Insp. of Rifle Prac., 8th Regt.
18	Solomon E. Japha, July 12, 1875	Ninth Regiment.
19	James C. Abrams, Sept. 29, 1875	Seventh Regiment.
20	Alvah G. Brown, January 16, 1876	Insp. Rifle Prac., 47th Regt.
21	Charles Wange, March 29, 1876	Thirty-second Regiment.
22	Joseph Egolf, May 18, 1876	Twelfth Separate Company.
23	James W. Cusack, Feb. 3, 1877	Sixth Separate Company.
24	Hugh H. Heron, March 1, 1877	Twenty-ninth Separate Co.
25	Stephen P. Ryan, August 9, 1877	Sixty-ninth Regiment.
26	Thomas M. Barber, Oct. 16, 1877	Fortieth Separate Company.
27	Horatio P. Stacpole, Dec. 19, 1877	Tenth Battalion.
28	William F. Grotz, March 27, 1878	Thirty-second Regiment.
29	Henry S. Steele, June 3, 1878	Seventh Regiment.
30	John Raines, July 5, 1878	Twenty-Fifth Separate Co.
31	William L. Watson, July 8, 1878	Thirteenth Regiment.
32	William R. Pettigrew, Sept. 11, 1878	Forty-seventh Regiment.
33	Daniel Appleton, Jan. 13, 1879	Seventh Regiment.
34	G. Henry Witthaus, March 1, 1879	Supernum'ary, with 9th Regt.
35	Matthew W. Marvin, May 20, 1879	Thirty-third Separate Co.
36	Berthold Myers, September 11, 1879	Fifteenth Separate Co.
37	James S. Garrett, February 2, 1880	Eigthteenth Separate Co.
38	Thomas Miller, Jr., February 25, 1880,	Seventeenth Separate Co.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued).*

Number.	NAME AND DATE OF RANK.	Organization.
	Captains — (Continued).	
39	Joseph R. K. Barlow, March 22, 1880 ..	Fourteenth Regiment.
40	Austin A. Yates, June 12, 1880	Thirty-sixth Separate Co.
41	George Loeser, September 30, 1880.....	Eleventh Regiment.
42	George B. Rhoads, October 25, 1880....	Seventh Regiment.
43	Henry C. Aspinwall, Nov. 24, 1880	Twelfth Regiment.
44	James G. Cunningham, Dec. 6, 1880 ...	Sixty-ninth Regiment.
45	James T. Chase, March 17, 1881.....	Fifth Separate Company.
46	Ferdinand P. Earle, April 5, 1881	Second Battery.
47	William M. Kirby, May 11, 1881	Second Separate Company.
48	William J. Collins, August 12, 1881	Thirteenth Regiment.
49	Charles Lee Abell, October 3, 1881	Seventy-fourth Rgiment.
50	Frank J. LeCount, Jr. Nov. 25, 1881....	Forty-seventh Regiment.
51	James Conlon, December 27, 1881.....	Sixty-ninth Regiment.
52	Welcome B. Randall, Feb. 17, 1882. ..	Forty-first Separate Co.
53	Augustus W. Conover, March 31, 1882,	Seventh Regiment.
54	Edward Verdeckberg, March 31, 1882,	Thirty-second Regiment.
55	George C. Fox, May 9, 1882	Seventy-fourth Regiment.
56	Henry S. Rasquin, May 22, 1882.....	Third Battery.
57	William H. Kirby, Jr., June 20, 1882...	Twelfth Regiment.
58	Angelo C. Lewis, July 3, 1882	Sixty-fifth Regiment.
59	Peter Paulus, November 27, 1882.....	Seventy-fourth Regiment.
60	Louis Wendel, December 15, 1882.....	First Battery.
61	George T. Lorigan, January 11, 1883 ..	Ninth Regiment.
62	Ezra De Forrest, January 29, 1883	Twenty-third Regiment.
63	Robert H. Montgomery, Jan. 31, 1883,	Sixty-fifth Regiment.
64	Arthur M. Murphy, February 24, 1883,	Sixteenth Separate Co.
65	Bernhardt Ranft, March 13, 1883.....	Eleventh Regiment.
66	Washington Content, March 27, 1883...	Twelfth Regiment.
67	William Franklin, April 23, 1883	Insp. Rifle Prac., 74th Regt.
68	W. Emlen Roosevelt, April 23, 1883	Aide-de-Camp, 1st Brigade.
69	Frank T. Bloomer, April 27, 1883.....	Seventy-fourth Regiment.
70	William H. Palmer, May 1, 1883.....	Insp. Rifle Prac., 7th Regt.
71	William V. King, May 7, 1883.....	Twenty-second Regiment.
72	Edgar V. Dennison, May 10, 1883	Tenth Battalion.
73	Robert C. McEwen, May 28, 1883	Twenty-second Separate Co.
74	George H. Howard, Sept. 17, 1883.....	Sixty-fifth Regiment.
75	Willard L. Candee, October 17, 1883....	Twenty-third Regiment.
76	Dennis C. McCarthy, Nov. 1, 1883.....	Sixty-ninth Regiment.
77	Otto F. Langenbach, Nov. 13, 1883.....	Sixty-fifth Regiment.
78	William H. Murphy, Dec. 20, 1883.....	Twelfth Regiment.
79	George W. Marlette, Dec. 27, 1883	Thirty-seventh Separate Co.
80	Emil Broggelwirth, Dec. 28, 1883.....	Thirty-second Regiment.
81	John J. Dixon, January 10, 1884	Fourteenth Regiment.
82	William H. Eddy, February 4, 1884	Forty-seventh Regiment.
83	William V. Peacon, March 18, 1884	Fourteenth Regiment.
84	George E. B. Hart, March 28, 1884.....	Twenty-second Regiment.
85	William F. Morris, April 24, 1884.....	Fourteenth Regiment.
86	Parker G. Tymerson, May 7, 1884.....	Seventh Separate Company.
87	Andrew I. Budlong, May 20, 1884	Thirty-first Separate Co.
88	Alvah H. Doty, May 21, 1884	Asst. Surgeon, Ninth Rgt.
89	George W. York, May 21, 1884	As. Sur., Seventy-fourth Rgt.
90	Samuel Hemingway, May 21, 1884	Asst. Surgeon, Eighth Rgt.
91	Harry M. Sims, May 21, 1884.....	As. Sur., Twenty-second Rgt.
92	Hiram C. Rogers, May 27, 1884.....	Twentieth Separate Co.
93	James L. Hyatt, June 2, 1884.....	Tenth Battalion.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued).*

Number.	NAME AND DATE OF RANK.	Organization.
	Captains—(Continued.)	
94	James M. White, June 3, 1884	Fourteenth Regiment.
95	Noah L. Cocheu, June 23, 1884	Ninth Regiment.
96	Bleecker S. Barnard, August 1, 1884	Twelfth Regiment.
97	Albert J. Dance, August 4, 1884	Seventy-fourth Regiment.
98	Richard P. Morle, October 3, 1884	Thirteenth Regiment.
99	William Wilson, October 6, 1884	Thirty-fourth Separate Co.
100	Samuel Foster, October 13, 1884	Twenty-first Separate Co.
101	Andrew Mills, October 20, 1884	Seventh Regiment.
102	Charles O. Davis, October 21, 1884	Thirteenth Regiment.
103	George C. Jeffery, October 29, 1884	As. Sur., Forty-seventh Rgt.
104	George F. Demarest, Nov. 3, 1884	Twenty-second Regiment.
105	Louis E. Lefferts, December 3, 1884	Seventh Regiment.
106	William K. Cortelyou, Dec. 19, 1884	Twenty-second Regiment.
107	George H. Bishop, December 23, 1884	Thirty-second Regiment.
108	L. Frank Barry, January 7, 1885	Seventy-first Regiment.
109	Charles Lutellus Lindley, Jan. 23, 1885,	Asst. Surgeon, Twelfth Rgt.
110	Fred. C. Cocheu, January 26, 1885	Twenty-third Regiment.
111	Roscius Morse, February 5, 1885	Thirtieth Separate Company.
112	John P. Leo, February 18, 1885	Twenty-second Regiment.
113	James R. Miller, February 24, 1885	Thirty-ninth Separate Co.
114	John J. Cosgrove, March 1, 1885	As. Surgeon, Sixty-ninth Rgt.
115	Harold L. Crane, March 13, 1885	Twenty-third Regiment.
116	Charles W. Eddy, March 20, 1885	Thirty-second Separate Co.
117	Thomas Mortimer, March 23, 1885	Sixty-ninth Regiment.
118	Andrew A. Oates, April 13, 1885	Eighth Regiment.
119	Maurice Cox, April 27, 1885	Sixty-ninth Regiment.
120	Wright D. Goss, April 30, 1885	Seventy-first Regiment.
121	E. Austin Oothout, May 5, 1885	Eighth Regiment.
122	Francis Albrecht, May 11, 1885	Eleventh Regiment.
123	Theodore F. Schmidt, May 21, 1885	Eleventh Regiment.
124	William Kerby, May 22, 1885	Thirteenth Regiment.
125	Frederick L. Holmes, June 3, 1885	Twenty-third Regiment.
126	George F. Potter, June 18, 1885	Twenty-second Regiment.
127	Geo. William Collins, June 30, 1885	Asst. Surgeon, Eleventh Rgt.
128	Abraham Gridley, July 3, 1885	First Separate Company.
129	William F. Dent, July 13, 1885	Seventy-fourth Regiment.
130	Howland Pell, August 25, 1885	Twelfth Regiment.
131	Alfred P. Delcambre, Oct. 6, 1885	Seventy-first Regiment.
132	Charles F. Surbrug, Oct. 12, 1885	Seventy-first Regiment.
133	John F. Boylan, Oct. 26, 1885	Twelfth Regiment.
134	Henry W. Leonard, Nov. 4, 1885	Ninth Regiment.
135	Charles B. Gaskill, Nov. 9, 1885	Forty-second Separate Co.
136	John H. Swanson, Nov. 9, 1885	Sixty-fifth Regiment.
137	W. Wolcott Marks, Nov. 10, 1885	Ninth Regiment.
138	Theodore H. Swift, Dec. 15, 1885	Ninth Regiment.
139	Isaac N. Pressey, Dec. 21, 1885	Eleventh Separate Company.
140	Charles A. Denike, Dec. 21, 1885	Forty-seventh Regiment.
141	William R. Clough, Dec. 22, 1885	Ninth Regiment.
142	William H. Dewar, Feb. 3, 1886	Eighth Regiment.
143	Francis Root Keating, Feb. 9, 1886	Aide-de-Camp, Fourth Brig.
144	John Cutts, Feb. 19, 1886	Fourteenth Regiment.
145	Frank J. Stearns, March 11, 1886	Thirty-eighth Separate Co.
146	Thomas M. Young, March 15, 1886	Eighth Regiment,
147	Augustus T. Francis, March 19, 1886	Seventy-first Regiment.
148	Willoughby Powell, March 19, 1886	Thirteenth Regiment.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued)*.

Number.	NAME AND DATE OF RANK.	Organization.
	Captains — (Continued).	
149	Albert J. Wing, March 22, 1886	Tenth Battalion.
150	Britton C. Thorn, March 30, 1886	Twenty-third Regiment.
151	William E. Preece, April 2, 1886	Twenty-second Regiment.
152	Frank N. Farrar, April 8, 1886	Seventy-fourth Regiment.
153	Charles M. Kennedy, April 13, 1886	Seventy-first Regiment.
154	Fred. G. Winter, May 7, 1886	Asst. Sur. Thirty-second Reg.
155	Fred. T. Leigh, May 8, 1886	Sup., on duty with Sec. Brig.
156	Joseph Worster Hale, May 18, 1886	In. Rifle Prac., Eleventh Reg.
157	Harry D. Cooper, May 21, 1886	Seventh Regiment.
158	Francis D. Beard, May 24, 1886	Aide-de-Camp, Second Brig.
159	Frank L. R. Tetamore, June 2, 1886	Fourteenth Regiment.
160	Francis R. Appleton, Aug. 30, 1886	Aide-de-Camp, First Brig.
161	Darwin R. Aldrich, Sept. 2, 1886	Twenty-third Regiment.
162	Kasson C. Gibson, Sept. 6, 1886	In. Rifle Prac., Ninth Regt.
163	Chas. J. Peabody, Sept. 8, 1886	Aide-de-Camp, Third Brig.
164	Hobart W. Thompson, Sept. 8, 1886	Aide-de-Camp, Third Brig.
165	Walter Scott, Sept. 28, 1886	Third Separate Company.
166	Patrick J. Morgan, Oct. 26, 1886	Sixth-ninth Regiment.
167	John J. Klein, Oct. 29, 1886	Thirty-second Regiment.
168	Alexander T. Mason, Nov. 11, 1886	Eighth Regiment.
169	Nathaniel B. Thurston, Dec. 20, 1886	Twenty-second Regiment.
170	David F. Lucas, Dec. 29, 1886	Asst. Surg., Thirteenth Regt.
171	John Macaulay, Dec. 31, 1886	Twelfth Regiment.
172	James Thorne Harper, Jan. 13, 1887	Seventh Regiment.
173	Abel W. Belknap, Jan. 21, 1887	Seventy-first Regiment.
174	J. Frank Dillont, Feb. 4, 1887	Thirteenth Regiment.
175	Henry Holland, Feb. 8, 1887	Thirty-fifth Separate Co.
176	James E. Place, Feb. 15, 1887	Seventy-first Regiment.
177	Haughwout Howe, Mar. 5, 1887	Eighth Regiment.
178	Charles R. Wilson, Mar. 15, 1887	Aide-de-Camp, Fourth Brig.
179	Charles B. Wood, Mar. 17, 1887	Twenty-fourth Separate Co.
180	Culver Gilman Thyng, Mar. 17, 1887	Forty-third Separate Co.
181	George J. Haffa, Mar. 22, 1887	Sixty-fifth Regiment.
182	John A. H. Dressel, Mar. 30, 1887	Seventy-first Regiment.
183	Hewlings H. Quick, April 12, 1887	Forty-seventh Regiment.
184	Geo. W. Mooney, April 14, 1887	Eleventh Regiment.
185	Van D. Macumber, April 25, 1887	I. R. P., Thirty-second Regt.
186	John J. Ryan, May 2, 1887	Ins. Rifle P., Sixty-eighth Rgt.
187	John B. Christoffel, Jr., May 6, 1887	Forty-seventh Regiment.
188	Charles F. Guyon, May 12, 1887	Twenty-third Regiment.
189	James W. Finch, May 16, 1887	Ins. R. Pr., Twenty-sec'd Rgt.
190	Joseph P. Jardine, May 25, 1887	Asst. in Subsistence Dept.
191	Henry Smith, May 31, 1887	Thirteenth Sep. Company.
192	William A. Valentine, June 1, 1887	Asst. Surgeon, Seventh Rgt
193	Henry A. Ely, June 17, 1887	Ninth Regiment.
194	William H. A. Cochran, July 6, 1887	Thirteenth Regiment.
195	Charles H. Hoyt, August 1, 1887	Ins. R. Pr., Seventy-first Rgt.
196	Edward J. Renison, August 9, 1887	Thirty-second Regiment.
197	Rufus Delafield, August 10, 1887	Twelfth Regiment.
198	Austin O. Crane, August 15, 1887	Fourteenth Regiment.
199	Edward Bennett, September 22, 1887	Fourteenth Regiment.
200	Daniel T. Everts, September 27, 1887	Forty-fourth Sep. Company.
201	William R. Pryor, October 1, 1887	Asst. Sur. Seventy-first Rgt.
202	Allison K. Hume, October 10, 1887	Sixty-fifth Regiment.
203	Hassell Nutt, October 10, 1887	Fourteenth Regiment.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued).*

Number.	NAME AND DATE OF RANK.	Organization.
	Captains — (Continued).	
204	Floyd S. Crego, October 25, 1887.....	Sixty-fifth Regiment.
205	George J. Metzger, November 1, 1887..	Ins. R. Pr., Sixty-fifth Rgt.
206	W. De L. Cunningham, Nov. 16, 1887..	Eighth Regiment.
207	Charles E. P. Babcock, Nov. 21, 1887....	Sixty-fifth Regiment.
208	Washington Wilcocks, Nov. 22, 1887...	Ninth Regiment.
209	Joseph N. Billings, Nov. 23, 1887.....	Ninth Regiment.
210	John I. Pruyn, November 26, 1887.....	Fourth Separate Company.
211	Henry L. Cochran, November 28, 1887..	Asst. Sur., Twenty-third Rgt.
212	Henry C. Everdell, Dec. 14, 188...7....	Twenty-third Regiment.
	First Lieutenants.	
1	Louis P. Haubennestel, Aug. 6, 1873...	Nineteenth Separate Co.
2	James O. Johnston, April 6, 1874.....	Adjutant, Eighth Regiment.
3	James Moran, Nov. 12, 1875.....	Adjutant, Sixty-ninth Regt.
4	Alexander Barnie, Jr., Feb. 11, 1876 ...	Quarterm'r, Fourteenth Rgt.
5	Charles F. Clark, May 29, 1876	Twenty-eighth Separate Co.
6	Thomas L. Miller, April 26, 1878	Quartermaster, 22d Regt.
7	Charles H. Paddock, July 5, 1878.....	Twenty-fifth Separate Co.
8	Harvey B. Moremus, May 20, 1879	Thirty-third Separate Co.
9	John A. Tackaberry, Feb. 9, 1880	Seventh Regiment.
10	George L. Wentworth, May 11, 1880 ...	Quartermaster, Eighth Regt.
11	William J. Maidhof, Nov. 22, 1880	Twenty-second Regiment.
12	John E. O'Brien, Dec. 6, 1880	Sixty-ninth Regiment.
13	Reuben Reynolds, Dec. 14, 1880.....	Twenty-third Separate Co.
14	Philip Miligan, Jan. 20, 1881	Com. Subsist., Eighth Regt.
15	John N. Underwood, Aug. 22, 1881.....	Sixth Battery.
16	James Mahoney, Dec. 6, 1881	Sixty-ninth Regiment.
17	Edward Milner, Jan. 10, 1882.....	Quarte master, 47th Regt.
18	Edward R. Powers, Jan. 30, 1882	Quartermaster, Twelfth Rgt.
19	Edwin J. Luff, Jan. 31, 1882	Fifth Battery.
20	Thomas Gregg, March 15, 1882.....	Thirty-seventh Separate Co.
21	Frederick S. Rice, April 25, 1882.....	Ninth Regiment.
22	John W. McDougall, May 17, 1882	Seventh Regiment.
23	John H. Curran, May 26, 1882	Fourteenth Regiment.
24	Willard C. Fisk, May 29, 1882	Seventh Regiment.
25	W. Romeyn Vermilye, June 7, 1882	Com'y Subsist., Ninth Regt.
26	Joseph Obermeyer, June 12, 1882	Eleventh Regiment.
27	Owen Lewis, June 19, 1882	Fourteenth Regiment.
28	Henry R. Clark, Aug. 5, 1882.....	Quartermaster, 74th Regt.
29	William W. Hanold, Sept. 2, 1882	Third Battery.
30	James J. Ward, Sept. 5, 1882	Quartermaster, 69th Reg..
31	Arthur A. Thompson, Sept. 18, 1882....	Quartermaster, 23d Regt.
32	George W. Rand, Nov. 16, 1882.....	Adjutant, Seventh Regiment.
33	Orin G. Nichols, Dec. 7, 1882	Com. Sub., Sixty-fifth Rgt.
34	J. Egmont Schermerhorn, Dec. 8, 1882.	Seventh Regiment.
35	James L. Thompson, Jan. 22, 1883.....	Sixth Separate Company.
36	Paul F. Leonard, April 11, 1883	Sixty-ninth Regiment.
37	William J. Sloan. April 23, 1883	Seventy-fourth Regiment.
38	Crawford E. Fritts, April 23, 1883	Asst. Surgeon, 23d Sep. Co.
39	William P. McLawry, May 11, 1883	Asst. Surgeon, 16th Sep. Co.
40	Athelbert D. Head, May 12, 1883	Asst. Surgeon, 40th Sep. Co.
41	Charles F. Tupper, May 24, 1883.....	Twentieth Separate Co.
42	Almeron D. Hayes, May 29, 1883.....	Fifth Battery.
43	Charles E. Oberest, May 30, 1883	Seventy-fourth Regiment.
44	Daniel S. Burr, May 31, 1883	Asst. Surgeon, 20th Sep. Co.
45	Frank Pawling, June 7, 1883.....	Seventh Regiment.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued)*.

Number.	NAME AND DATE OF RANK.	Organization.
	First Lieutenants — (Continued).	
46	Stuart B. Carlisle, June 14, 1883	Asst. Surgeon, 11th Sep. Co.
47	John Gerin, July 16, 1883	Asst. Surgeon, 2d Sep. Co.
48	Clarkson C. Schuyler, Aug. 23, 1883	Asst. Surgeon, Sixth Sep. Co.
49	Benjamin L. Holt, Sept. 8, 1883	Asst. Surgeon, First Sep. Co.
50	John P. Wilson, Sept. 20, 1883	Asst. Surgeon, 19th Sep. Co.
51	John C. White, Oct. 8, 1883	Adj't, Seventy-fourth Regt.
52	Mason L. Smith, Oct. 23, 1883	Asst. Surgeon, 39th Sep. Co.
53	James F. White, Nov. 8, 1883	Thirty-sixth Separate Co.
54	Norman MacDonald, Nov. 12, 1883	Twenty-second Regiment.
55	Charles W. Crispell, Nov. 20, 1883	Asst. Surgeon, 14th Sep. Co.
56	John H. Wells, Nov. 23, 1883	Fifth Separate Company.
57	William T. Clute, Dec. 31, 1883	Asst. Surgeon, 36th Sep. Co.
58	William Hogan, Feb. 7, 1884	Sixty-ninth Regiment.
59	Arthur F. Schermerhorn, Feb. 11, 1884,	Adjutant, Twelfth Regiment.
60	William Vander Clute, Jr., Feb, 15, 1884,	Adjutant, Thirty-second Rgt.
61	Robert H. Sillmann, March 11, 1884	Thirteenth Regiment.
62	John T. Jennings, March 24, 1884	Thirteenth Regiment.
63	Harry A. Beneke, March 28, 1884	Twenty-second Regiment.
64	Franklin Bartlett, April 4, 1884	Ninth Regiment.
65	Benjamin C. Senton, April 4, 1884	Asst. Surgeon, Ninth Sep. Co.
66	Yellott D. Dechert, April 28, 1884	Adjutant, Ninth Regiment.
67	T. Campbell Collin, May 7, 1884	Seventh Separate Company.
68	Richard Oliver, May 12, 1884	Com. Subsist., 23d Regt.
69	John F. Long, June 2, 1884	Quartermaster, Seventh Rgt.
70	Frank F. Thompson, June 10, 1884	Fourteenth Regiment.
71	George H. Rice, July 24, 1884	Fourteenth Regiment.
72	Alfred B. Campbell, Aug. 4, 1884	Adjutant, Fourteenth Regt.
73	John B. Woods, Sept. 1, 1884	Sixty-ninth Regiment.
74	George C. Schell, Nov. 7, 1884	Thirty-fourth Separate Co.
75	Philip Fogarty, Nov. 18, 1884	Sixty-fifth Regiment.
76	David Wilson, Nov. 28, 1884	Second Battery.
77	William H. Hubbell, Dec. 10, 1884	Adjt., Forty-seventh Regt.
78	John Murphy, Dec. 29, 1884	Sixty-ninth Regiment.
79	William E. Otto, Jan. 13, 1885	Seventy-fourth Regiment.
80	George Zechiel, Jan. 26, 1885	Com. Subsist., 32nd Regt.
81	Arthur L. Hall, Jan. 26, 1885	Twenty-second Separate Co.
82	John S. Shepherd, Feb. 9, 1885	Twenty-third Regiment.
83	Maxwell C. Burger, Feb. 10, 1885	Thirty-second Regiment.
84	Harrison C. Balcom, Feb. 11, 1885	Seventy-fourth Regiment.
85	Lawrence Buckley, Feb. 13, 1885	Twenty-first Separate Co.
86	Warren E. Smith, Feb. 18, 1885	Forty-seventh Regiment.
87	Albert L. Beahan, Feb. 21, 1885	Assistant in Medical Dept.
88	William W. Scott, Feb. 24, 1885	Thirty-ninth Separate Co.
89	George E. Hall, March 13, 1885	Twenty-third Regiment.
90	Adolph L. Kline, March 16, 1885	Fourteenth Regiment.
91	Frank L. Stevens, March 20, 1885	Thirty-second Separate Co.
92	Charles H. McIlvaine, March 23, 1885	Forty-seventh Regiment.
93	Samuel Parsons, April 7, 1885	Twelfth Regiment.
94	William D. Wood, April 10, 1885	Thirty-second Regiment.
95	David H. Teets, April 16, 1885	Seventy-first Regiment.
96	Joseph B. Davis, April 29, 1885	Forty-seventh Regiment.
97	Francis J. Veritzan, May 27, 1885	Forty-seventh Regiment.
98	John F. O'Connor, June 8, 1885	Thirteenth Regiment.
99	William Desmond, June 16, 1885	Sixty-ninth Regiment.
100	Walter G. Schuyler, July 31, 1885	Com. Subsist., Seventh Regt.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued.)*

Number.	NAME AND DATE OF RANK.	Organization.
	First Lieutenants — (Continued.)	
101	Arthur W. Pray, Sept. 16, 1885	Tenth Battalion.
102	Clarence M. Skellen, Sept. 17, 1885	Twenty-second Regiment.
103	Mark J. Blakely, Sept. 24, 1885	Forty-first Separate Co.
104	Frederick Yung, Sept. 30, 1885	Quartermaster, 11th Regt.
105	Richard A. Denahan, Oct. 5, 1885	Eleventh Regiment.
106	George T. Wilkins, Oct. 5, 1885	First Separate Company.
107	J. G. B. Lilliendahl, Oct. 12, 1885	Twenty-second Regiment.
108	Charles H. Collins, Oct. 13, 1885	Eleventh Regiment.
109	Eugene W. Burd, Oct. 16, 1885	Adjutant, Twenty-Third Rgt.
110	William A. Brown, Oct. 30, 1885	Thirteenth Regiment.
111	Philip H. Williams, Nov. 7, 1885	Adjutant, Eleventh Regt.
112	Lauren W. Pettebone, Nov. 9, 1885	Forty-second Separate Co.
113	Robert Warrell, Nov. 10, 1885	Ninth Regiment.
114	William S. Banta, Nov. 16, 1885	Twenty-third regiment.
115	George B. McClellan, Dec. 1, 1885	Eighth Regiment.
116	Albion J. Kiernan, Dec. 10, 1885	Tenth Battalion.
117	Edwin J. Kindler, Dec. 21, 1885	Eleventh Separate Company.
118	Charles P. Fish, Dec. 28, 1885	Thirteenth Regiment.
119	Edward C. Smith, Dec. 28, 1885	Twelfth Regiment.
120	Alfred Jefferson, Jan. 5, 1886	Seventy-first Regiment.
121	Walter S. Wilson, Jan. 8, 1886	Seventh Regiment.
122	William W. Chilton, Jan. 20, 1886	Seventy-first Regiment.
123	Geo. W. Middleton, Jr., Jan. 21, 1886	Twenty-third Regiment.
124	Delos M. Dodge, Feb, 8, 1886	Thirty-first Separate Co.
125	James R. Byrd, Feb. 9, 1886	Twenty-second Regiment.
126	Samuel D. Hyatt, Feb. 25, 1886	Tenth Battalion.
127	Frank J. Hess, March 12, 1886	Eighth Separate Company.
128	Paul V. Harris, March 19, 1886	Seventy-first Regiment.
129	William H. Chapin, March 22, 1886	Adjutant, Sixty-fifth Regt.
130	Peter Carroll, March 29, 1886	Sixty-ninth Regiment.
131	James B. Sanders, April 1, 1886	Adjutant, Tenth Battalion.
132	James O'Neill, April 6, 1886	Twenty-second Regiment.
133	John F. Clark, April 8, 1886	Seventy-fourth Regiment.
134	James H. Russell, April 27, 1886	Thirty-second Regiment.
135	William R. Owens, May 7, 1886	Fourteenth Regiment.
136	John H. Leonard, May 7, 1886	Eighteenth Separate Co.
137	Benjamin A. Church, May 8, 1886	Asst. Sur., Third Sep. Co.
138	George C. Miller, May 24, 1886	Twenty-second Regiment.
139	Joseph T. Hull, June 7, 1886	Twenty-second Regiment.
140	Edward H. Griswold, June 9, 1886	Asst. Sur., 42d Sep. Co.
141	Wm. Clarke Roe, June 11, 1886	Forty-seventh Regiment.
142	Austin E. Allen, June 14, 1886	Seventh Regiment.
143	George F. Whitney, June 28, 1886	Asst. Sur., Fourth Sep. Co.
144	De Solvo H. Tifft, July 12, 1886	Thirty-eighth Separate Co.
145	Eugene Z. Brievogelle, Aug. 12, 1886	Asst. Sur., First Battery.
146	John Radcliffe, Aug. 24, 1886	Sixty-fifth Regiment.
147	Frank Roosevelt, Aug. 27, 1886	Twelfth Regiment.
148	William B. Smith, Sept 8, 1886	Adj., Twenty-second Regt.
149	William B. Morrow, Sept. 10, 1886	Asst. Surgeon, 33d Sep. Co.
150	Willis R. Buck, Oct. 11, 1886	Com. of Sub., 74th Regiment.
151	Charles E. Kohlberger, Oct. 20, 1886	Ninth Regiment.
152	William T. Miles, Nov. 1, 1886	I. R. P., Tenth Battalion.
153	James H. Mitchell, Nov. 10, 1886	Asst. Sur., Seventh Sep. Co.
154	Henry L. Cammann, Nov. 11, 1886	Eighth Regiment.
155	Alfred E. Steers, Nov. 15, 1886	Fourteenth Regiment.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued).*

Number.	NAME AND DATE OF RANK.	Organization.
	First Lieutenants — (Continued).	
156	Daniel A. Nesbitt, Nov. 18, 1886	Seventh Regiment.
157	Dana P. Pratt, Nov. 19, 1886	Quartermaster, Ninth Regt.
158	Edward C. O'Brien, Dec. 7, 1886	Seventy-first Regiment.
159	Henry S. Dunning, Dec. 28, 1886	Second Separate Company.
160	Lewis M. Reed, Dec. 29, 1886	Com. of Sub., 13th Regiment.
161	Chas. W. Topping, Dec. 29, 1886	Quartermaster, 13th Regt.
162	Crawford D. Beasley, Jan. 3, 1887	Asst. Surgeon, Third Batt.
163	Fred B. Streeter, Jan. 7, 1887	Asst. Surgeon, 18th Sep. Co.
164	Harry C. Baum, Jan. 12, 1887	Asst. Sur., 41st Separate Co.
165	Arthur C. Sanders, Jan. 17, 1887	Twenty-third Regiment.
166	Harold Christensen, Jan. 17, 1887	Eleventh Regiment.
167	William J. Whited, Jan. 17, 1887	Tenth Separate Company.
168	Horace C. Du Val, Feb. 10, 1887	Seventh Regiment.
169	Burr Mattice, Feb. 17, 1887	Third Separate Company.
170	William Monaghan, Feb. 23, 1887	Twenty-ninth Separate Co.
171	John J. Elzenbeck, Feb. 23, 1887	Thirty-second Regiment.
172	Frank N. Bell, March 1, 1887	Seventeenth Separate Co.
173	Maurice D. Quiry, March 2, 1887	Seventy-first Regiment.
174	Benjamin L. Love, March 9, 1887	Seventy-fourth Regiment.
175	Philip S. Tilden, March 10, 1887	Adj., Seventy-first Regiment.
176	Walter F. Murzey, March 10, 1887	Sixty-fifth Regiment.
177	James W. Gerard, Jr., March 10, 1887	Twelfth Regiment.
178	Henry Fred Lee, March 17, 1887	Forty-third Separate Co.
179	Amos E. McIntyre, March 17, 1887	Twenty-fourth Separate Co.
180	R. George Williams, April 1, 1887	Forty-seventh Regiment.
181	William Brooke, April 8, 1887	Seventy-first Regiment.
182	Jacob R. Teel, April 8, 1887	Quartermaster, 32d Regt.
183	Seldon Johnson Mudge, April 12, 1887	Asst. Sur., 43d Separate Co.
184	John G. Van Etten, April 14, 1887	Fourteenth Separate Co.
185	Lawrence M. Proctor, April 19, 1887	Thirty-fifth Separate Co.
186	John W. Benton, April 28, 1887	Asst. Sur., 35th Separate Co.
187	Robert E. Ford, May 1, 1887	Com. Sub., Sixth-ninth Regt.
188	William P. Pickett, May 2, 1887	Twenty-third Regiment.
189	John A. Quigley, May 4, 1887	Twenty-second Regiment.
190	James P. Kenworthy, May 6, 1887	Twenty-second Regiment.
191	George G. Cockran, May 6, 1887	Thirteenth Regiment.
192	James B. Dewson, May 7, 1887	Seventh Regiment.
193	Edward M. Hoffman, May 11, 1887	Thirtieth Separate Company.
194	J. Wilton Barlow, May 17, 1887	Forty-seventh Regiment.
195	John McCauley, May 17, 1887	Sixty-ninth Regiment,
196	Floyd B. Parke, May 20, 1887	Asst. Surg., 26th Sep. Co.
197	Thomas A. Paterson, June 15, 1887	Ninth Separate Company.
198	William A. Underhill, June 17, 1887	Twenty-third Regiment.
199	George C. Heilner, June 20, 1887	Eighth Regiment.
200	John F. Griffith, June 21, 1887	First Battery.
201	Robert H. McKittrick, June 24, 1887	Thirty-second Regiment.
202	Emile F. Christoffel, June 27, 1887	Forty-seventh Regiment.
203	Jarvis W. Mason, July 1, 1887	Eleventh Regiment.
204	J. Emory Haskell, July 5, 1887	Com. Sub., Twelfth Regt.
205	James Myall, July 5, 1887	Fortieth Separate Company.
206	Joseph M. Smith, July 7, 1887	Com. Sub. Twenty-sec'd Reg.
207	Geo. A. Williams, July 11, 1887	Twenty-third Regiment.
208	Charles M. Jessup, July 13, 1887	Twelfth Regiment.
209	Edgar S. Auchincloss, Aug. 1, 1887	Com. Sub,, 71st Regiment.
210	William E. D. Stokes, Aug. 1, 1887	Quartermaster 77st Regt.,

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued)*.

Number.	NAME AND DATE OF RANK.	Organization.
	First Lieutenants—(Continued).	
211	Lourie Ashton, Aug. 20, 1887	Asst. Sur., 32d Separate Co.
212	Charles G. Schroeneck, Aug. 26, 1887	Thirty-second Regiment.
213	George Fleischer, Sept. 1, 1887	Eleventh Regiment.
214	William Marvin Bemus, Sept. 23, 1887	Asst. Sur., 13th Separate Co.
215	John Cummings, Jr., Sept. 27, 1887	Forty-fourth Separate Co.
216	Frederick Foster Carey, Sept. 29, 1887	Twelfth Regiment.
217	Peter E. Erickson, Sept. 29, 1887	Fourteenth Regiment.
218	Michael T. Carroll, Sept. 30, 1887	Asst. Sur., Second Battery.
219	Robert A. Elliott, Oct. 4, 1887	Eleventh Regiment.
220	George W. Crooks, Oct 6, 1887	Twenth-seventh Separate Co.
221	James M. Rankin, Oct. 10, 1887	Eleventh Regiment.
222	Charles L. Spier, Oct. 10, 1887	Forty-seventh Regiment.
223	G. James Greene, Oct. 15, 1887	Tenth Battalion.
224	Edward J. McGlynn, Oct. 18, 1887	Thirty-second Regiment.
225	Clinton H. Smith, Oct. 18, 1887	Seventy-first Regiment.
226	Arthur E. Schuman, Oct. 18, 1887	Twelfth Regiment.
227	Walter L. Miller, Nov. 9, 1887	Eleventh Regiment.
228	Albert J. Myer, Nov. 15, 1887	Sixty-fifth Regiment.
229	Charles Nagel, Nov. 15, 1887	First Battery.
230	Edward A. Hall, Dec. 5, 1887	Sixty-fifth Separate Co.
	Second Lieutenants.	
1	Patrick Farrelly, June 25, 1877	Sixty-ninth Regiment.
2	Martin L. Beutell, Jan. 2, 1878	Nineteenth Separate Co.
3	Samuel T. Skinner, March 3, 1879	Thirteenth Regiment.
4	George C. Robinson, May 20, 1879	Thirty-third Separate Co.
5	James B. Manahan, May 24, 1880	Sixty-ninth Regiment.
6	J. M. Bellinger, Dec. 6, 1880	Thirty-first Separate Co.
7	Adolph E. Dick, April 20, 1881	Twenty-second Regiment.
8	Thomas F. Kearns, May 31, 1881	Thirty-ninth Separate Co.
9	John H. Gross, June 10, 1881	Sixth Battery.
10	Robert A. Hall, April 20, 1882	Ninth Separate Company.
11	Luke C. Quinn, May 18, 1882	Sixty-ninth Regiment.
12	James H. Vedder, July 29, 1882	Thirty-seventh Separate Co.
13	George D. Smith, Jan. 22, 1883	Sixth Separate Company.
14	Andrew C. Harwick, Jan. 26, 1883	First Separate Company.
15	Edward J. Little, May 3, 1883	Seventy-first Regiment.
16	William H. Gadow, June 20, 1883	Fifth Battery.
17	Frank D. Lyon, July 2, 1883	Twentieth Separate Co.
18	Harrie C. Appleton, Dec. 28, 1883	Twelfth Regiment.
19	George F. Chatterton, May 26, 1884	Fortieth Separate Company.
20	Edward T. McCrystal, June 16, 1884	Sixty-ninth Regiment.
21	Thomas J. McNeil, June 20, 1884	Seventh Separate Company.
22	Samuel Duncan Bell, July 1, 1884	Third Battery.
23	Anthime W. LaRose, July 10, 1884	Tenth Battalion.
24	Alfred T. Rycraft, July 28, 1884	Twenty-eighth Separate Co.
25	Henry W. Brendel, Sept. 15, 1884	Sixty-fifth Regiment.
26	Merrill M. Dunspaugh, Oct. 13, 1884	Twenty-first Separate Co.
27	Charles E. Leydecker, Oct. 24, 1884	Seventh Regiment.
28	Theodore S. Croft, Nov. 12, 1884	Ninth Regiment.
29	Eugene T. Kirkland, Dec. 3, 1884	Seventh Regiment.
30	Patrick J. Moriartty, Dec. 15, 1884	Sixty-ninth Regiment.
31	Jerome C. Fredenburg, Dec. 17, 1884	Twenty-fifth Separate Co.
32	John O'Connell, Dec. 29, 1884	Sixty-ninth Regiment.
33	William McLaughlin, Jan. 12, 1885	Sixty-ninth Regiment.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued)*.

Number.	NAME AND DATE OF RANK.	Organization.
	Second Lieutenants — (Continued).	
34	George E. Pasco, Jan. 27, 1885	Fifth Battery.
35	Theodore W. Sillcocks, March 13, 1885,	Twenty-third Regiment.
36	James Alexander, March 17, 1885	Thirteenth Regiment.
37	Thomas D. Henry, March 18, 1885	Fourteenth Regiment.
38	George H. Walden, March 20, 1885	Thirty-second Separate Co.
39	John N. Bates, March 25, 1885	Fifth Battery.
40	Edmund L. Knoedler, April 7, 1885	Twelfth Regiment.
41	Alex. E. Oberlander, April 9, 1885	Forty-first Separate Co.
42	Waldo L. Rich, April 20, 1885	Twenty-second Separate Co.
43	Thomas F. Ryder, May 19, 1885	Twenty-second Regiment.
44	John D. Walton, July 16, 1885	Ninth Regiment.
45	William H. McVicar, August 5, 1885	Fourth Separate Company.
46	Charles A. DuBois, Oct. 12, 1885	Twenty-second Regiment.
47	Gilbert Lloyd, Oct. 16, 1885	Fourteenth Regiment.
48	Augustus Baus, Oct. 28, 1885	Twelfth Regiment.
49	Mighells B. Butler, Nov. 9, 1885	Forty-second Separate Co.
50	William H. Ehrmann, Nov. 10, 1885	Ninth Regiment.
51	William Luthy, Dec. 4, 1885	Thirty-second Regiment.
52	Joseph E. Taverner, Dec. 21, 1885	Eleventh Separate Company.
53	Wilbur B. Bradley, Jan. 8, 1886	Seventh Regiment.
54	Chas. R. Silkman, Jan. 18, 1886	Twenty-third Regiment.
55	Chas. C. Wallace, Jan. 20, 1886	Fourteenth Regiment.
56	George F. Hamlin, Jan. 21, 1886	Twenty-third Regiment.
57	Wm. H. B. Smith, Feb. 19, 1886	Twenty-third Regiment.
58	Louis Gumbart, March 11, 1886	Eleventh Regiment.
59	William A. Angus, April 8, 1886	Seventy-fourth Regiment.
60	Robert J. Daley, April 8, 1886	Twenty-second Regiment.
61	Robert P. Forshew, May 10, 1886	Sixteenth Separate Company.
62	Albert L. Judson, May 10, 1886	Tenth Battalion.
63	George E. Gatley, May 12, 1886	Seventy-fourth Regiment.
64	J. Edward Swanker, June 1, 1886	Thirty-sixth Separate Co.
65	Wm. H. Coughlin, June 7, 1886	Thirteenth Regiment.
66	James H. Edwards, June 10, 1886	Tenth Battalion.
67	Alonzo W. Hill, June 23, 1886	Twelfth Separate Company.
68	James J. McKenna, June 28, 1886	Seventh Regiment.
69	Fred. G. Peoble, July 9, 1886	Thirteenth Regiment.
70	Franklin Bouker, July 30, 1886	Seventh Regiment.
71	Robert T. Holly, Sept. 13, 1886	Twenty-third Regiment.
72	Robert S. Copeland, Sept. 17, 1886	Thirteenth Regiment.
73	Alfred H. Murphy, Sept. 20, 1886	Twenty-second Regiment.
74	Lewis G. Northrup, Oct. 5, 1886	Sixty-fifth Regiment.
75	Edmund P. Cottle, Oct. 19, 1886	Seventy-fourth Regiment.
76	Knight Neftel, Oct. 26, 1886	Eighth Regiment.
77	Eugene E. Bishop, Oct. 27, 1886	Forty-seventh Regiment.
78	Ellsworth R. De Bow, Nov. 9, 1886	Twenty-second Regiment.
79	Ike Freeman, Nov. 11, 1886	Eighth Regiment.
80	Henry Waterman, Nov. 16, 1886	Twenty-third Separate Co.
81	Charles B. Stone, Nov. 18, 1886	Seventy-first Regiment.
82	William N. Bavier, Nov. 22, 1886	Twenty-second Regiment.
83	Emile R. Bangs, Nov. 22, 1886	Seventy-first Regiment.
84	Walter D. Haws, Dec. 20, 1886	Twenty-second Regiment.
85	John Lamb, Dec. 27, 1886	Twenty-second Regiment.
86	John J. Scanlon, Dec. 28, 1886	Sixty-ninth Regiment.
87	David K. Case, Jan. 17, 1887	Twenty-third Regiment.
88	Louis L. Coudert, Jan. 17, 1887	Eleventh Regiment.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued)*.

Number.	NAME AND DATE OF RANK.	Organization.
	Second Lieutenants — (Continued).	
89	Frederick A. Malette, Feb. 3, 1887	Thirty-fourth Separate Co.
90	George H. Gould, March 1, 1887	Seventh Regiment.
91	William T. Gouch, March 1, 1887	Seventy-first Regiment.
92	Frederick W. G. Bailey, March 2, 1887,	Eighth Separate Company.
93	George P. Camman, March 5, 1887	Eighth Regiment.
94	Edward J. Kraft, March 7, 1887	Twenty-third Regiment.
95	Henry L. Fish, Jr., March 9, 1887	Seventy-fourth Regiment.
96	Lewis S. Stivers, March 17, 1887	Twenty-fourth Sepa) (
97	Wilbert H. Carringer, March 17, 1887	Forty-third Separate Co.
98	Samuel Byron Newton, March 24, 1887.	Seventy-fourth Regiment.
99	A. Polhemus Cobb, April 1, 1887	Forty-seventh Regiment.
100	Thomas T. Haviland, April 4, 1887	Tenth Separate Company.
101	John B. Rawson, Jr., April 5, 1887	Sixty-fifth Regiment.
102	James M. Maconnell, April 18, 1887	Ninth Regiment.
103	Wallace F. Peck, April 26, 1887	Seventh Regiment.
104	Clarence James Barber, May 3, 1887	Second Separate Company.
105	Thomas M. Close, May 11, 1887	Twenty-third Regiment.
106	John T. Sadler, May 11, 1887	Thirtieth Separate Company.
107	J. Langdon Erving, May 12, 1887	Twelfth Regiment.
108	Clarence M. Davis, May 17, 1887	Seventy-first Regiment.
109	John McGreevy, May 25, 1877	Seventh Regiment.
110	Stephen W. Merritt, May 26, 1887	Seventh Regiment.
111	Francis J. Magee, May 26, 1887	Sixty-ninth Regiment.
112	Henry Deike, May 27, 1887	Seventy-first Regiment.
113	James H. Southworth, June 1, 1887	Seventy-first Regiment.
114	Emil J. Winterroth, June 15, 1887	Ninth Regiment.
115	Malcolm C. Murray, July 11, 1887	Twenty-second Regiment.
116	Clarence E. Hubbard, July 11, 1887	Twenty-third Regiment.
117	Dennis B. Lucey, July 14, 1887	Thirty-fifth Separate Co.
118	Forbes Dunderdale, July 15, 1887	Twenty-third Regiment.
119	John Rooney, August 9, 1887	Thirty-second Regiment.
120	Alfred C. Harrison, Jr., August 9, 1887.	Forty-seventh Regiment.
121	George D. Russell, August 12, 1887	Thirty-second Regiment.
122	Alexander Mitzel, Jr., August 12, 1887.	Thirty-second Regiment.
123	Frank R. Wiswell, August 16, 1887	Thirteenth Regiment.
124	Homer L. Bartlett, August 24, 1887	Forty-seventh Regiment.
125	Henry G. Paine, August 26, 1887	Twelfth Regiment.
126	Louis G. Briggs, August 29, 1887	Twelfth Regiment.
127	George C. Broome, Sept. 16, 1887	Thirteenth Regiment.
128	Edwin G. Bixby, Sept. 21, 1887	Third Separate Company.
129	Walter F. Barnes, Sept. 26, 1887	Third Battery.
130	Edmond A. O'Brien, Sept. 27, 1887	Forty-fourth Separate Co.
131	Oscar L. Rogers, Sept. 29 1887	Second Battery.
132	John O. Soderstrom, Sept. 29, 1887	Fourteenth Regiment.
133	William J. Burns, Oct. 4, 1887	Eleventh Regiment.
134	John Noble Golding, Oct. 14, 1887	Seventy-first Regiment.
135	James G. McMurray, Oct. 17, 1887	Ninth Regiment.
136	Charles W. Bridges, Oct. 17, 1887	Fourteenth Regiment.
137	William Finkelmeier, Oct. 18, 1887	Thirty-second Regiment.
138	William F. Catterfield, Oct. 27, 1887	Twelfth Regiment.
139	Theodore Du Bois Freer, Nov. 3, 1887.	Fourteenth Separate Co.
140	Albert E. Batchelder, Nov. 12, 1887	Tenth Battalion.
141	Percy P. May, Nov. 18, 1887	Eleventh Regiment.
142	Warren F. H. Tupper, Nov. 30, 1887	Eleventh Regiment.
143	George H. Dunn, Dec. 1, 1887	Fifth Separate Company.
144	John C. McGlynn, Dec. 12, 1887	Thirty-second Regiment.

RELATIVE RANK OF OFFICERS IN ACTIVE SERVICE — *(Continued)*.

Number.	NAME AND DATE OF RANK.	Organization.
	Chaplains.	
1	William N. Dunnell, April 15, 1874.....	Twenty-second Regiment.
2	Newland Maynard, May 26, 1875.....	Forty-seventh Regiment.
3	Matthew P. Breen, Sept. 15, 1877.....	Sixty-ninth Regiment.
4	Wesley R. Davis, April 23, 1879.....	Eighth Regiment.
5	Walter North, January 10, 1880.....	Seventy-fourth Regiment.
6	J. Oramel Peck, May 22, 1882.....	Fourteenth Regiment.
7	William B. Frisbie, July 1, 1882.....	Twelfth Regiment.
8	Geo. R. Van De Water, May 24, 1886...	Twenty-third Regiment.
9	John W. Brown, August 25, 1886.....	Sixty-fifth Regiment.
10	Emil Arnold Meury, Sept. 30, 1887.....	Thirty-second Regiment.
11	John R. Paxton, November 16, 1887....	Seventh Regiment.

CASUALTIES.

HONORABLY DISCHARGED — (Full Discharge).

Brigadier-General.

Robert Shaw Oliver, Supernumerary, January 5, 1888.

Colonels.

Charles L. Fincke, 23d Regiment, May 11, 1887.
S. Douglas Cornell, Supernumerary, May 11, 1887.
Edwin A. McAlpin, 71st Regiment, June 30, 1887.
Edward Fackner, 13th Regiment, September 28, 1887.

Lieutenant-Colonels.

Appleton D. Palmer, 71st Regiment, February 17, 1887.
Edward M. Wunder, 32d Regiment, Nov. 15, 1887.

Majors.

Harlow C. Palmer, Inspector, 4th Brigade, April 21, 1887.
Edwin A. Lewis, Surgeon, 23d Regt., June 15, 1887.
Frederick W. Parisette, 32d Regt., November 7, 1887.

Captains.

Edwin S. Browe, Inspector of Rifle Practice, 14th Regt., Jan. 27, 1887.
Conrad A. Hult, 13th Separate Company, Feb. 2, 1887.
Walter C. Mason, 65th Regt., April 14, 1887.
Charles Vorgang, 65th Regt., April 21, 1887.
Moreau Morris, Assistant Surgeon, 7th Regt., May 5, 1887.
William Strining, 32d Regt., May 11, 1887.
James A. Mulligan, Brevet Major, 9th Regt., May 20, 1887.
James H. Parke, 9th Separate Company, May 26, 1887.
John M. Rankin, 47th Regt., June 30, 1887.
W. W. de Forest, Inspector of Rifle Practice, 12th Regt., Aug. 19, 1887.
M. Van Rensselaer, Jr., 8th Regt., Aug. 19, 1887.
Raffaelle Cobb, 4th Separate Company, Sept. 27, 1887.
Samuel W. Smith, 13th Regt., Oct. 5, 1887.
George W. Pattison, 65th Regt., Oct. 24, 1887.
Edgar F. Haviland, 23d Regt., Nov. 14, 1887.
William H. Barney, 27th Separate Company, Nov. 21, 1887.
Isaac H. West, 22d Regt., Nov. 30, 1887.
John W. Jenkins, 22d Regt., Nov. 30, 1887.
William R. Elting, 23d Separate Company, Nov. 30, 1887.
William H. Greenland, 23d Regt., Dec. 22, 1887.
William H. Smith, 10th Separate Company, Dec. 28, 1887.

First Lieutenants.

John H. Cornell, 47th Regt., Jan. 6, 1887.
David M. Totman, Assistant Surgeon, 41st Separate Company, Jan. 6, 1887.
John Hepburn, 17th Separate Company, Jan. 22, 1887.
Franklin P. Swazey, 23d Regt., Feb. 11, 1887.
Alfred W. Redfern, 14th Regt., March 8, 1887.
Robert McFeeley, 69th Regt., April 6, 1887.
Robert A. Decker, 65th Regt., April 14, 1887.
E. Graham Haight, 7th Regt., May 5, 1887.
Benjamin F. Prall, 30th Separate Company, May 11, 1887.
Rufus R. Davis, 9th Separate Company, May 26, 1887.
J. De Witt Clark, 23d Regt., June 10, 1887.
Richard Deeves, Commissary of Subsistence, 12th Regt., June 10, 1887.
Francis P. Harron, 23d Regt., June 30, 1887.
Stanislaus R. Bluemke, Brevet Captain, 32d Regt., July 15, 1887.

Edmund M. Christensen, 14th Regt., July 23, 1887.
Frederick D. Kilburn, 27th Separate Company, July 23, 1887.
Augustus K. Sangmaster, 10th Battalion, Sept. 21, 1887.
Charles Ulrich, 15th Separate Company, Oct. 6, 1887.
Julius Hochman, 11th Regt., Oct. 24, 1887.
Augustus W. Ljungberg, 13th Separate Company, Nov. 7, 1887.
McCoskry Bute, 12th Regt., Nov. 14, 1887.
Frank R. Pentz, 8th Regt., Nov. 21, 1887.
Frank A. Gale, 9th Regt., Nov. 30, 1887.
Daniel Sidney Appleton, 12th Regt., Dec. 20, 1887.
W. Irving Osborn, 16th Separate Company, January 6, 1888.

Second Lieutenants.

James J. Harris, 23d Regt., Jan. 6, 1887.
Claes E. Molin, 14th Regt., Jan. 27, 1887.
Stephen Steiniger, 8th Regt., Jan. 27, 1887.
Edward J. Clarry, 47th Regt., Feb. 3, 1887.
Edgar E. Sage, 7th Regt., Feb. 17, 1887.
John McCauley, 8th Regt., Feb. 17, 1887.
Daniel A. Skinnell, 9th Regt., March 3, 1887.
Gustaf F. Smith, 13th Separate Company, March 3, 1887.
William J. Clark, 14th Regt., March 31, 1887.
Patrick J. Goggin, 69th Regt., April 6, 1887.
Patrick McMorrow, 69th Regt., April 6, 1887.
Emile F. Christoffel, 47th Regt., April 6, 1887.
Thomas M. Harvey, 14th Regt., April 13, 1887.
Bradish J. Smith, 7th Regt., April 21, 1887.
Thomas W. McCormack, 47th Regt., May 11, 1887.
Jas. E. Ware, 7th Regt, May 24, 1887.
George S. Ralston, 74th Regt., June 17, 1887.
Harvey P. Hungerford, 23d Regt., July 12, 1887.
Charles F. E. Menge, 74th Regt., Aug. 10, 1887.
Pardon T. Perkins, 29th Separate Company, Sept. 27, 1887.
William H. Anketell, 9th Regt., Nov. 30, 1887.
Henry S. Kaliske, 12th Regt., Dec. 14, 1887.
Joseph Fitch, 17th Separate Company, Dec. 29, 1887.

HONORABLY DISCHARGED — ACCEPTANCE OF RESIGNATION.

Brigadier-General.

Lloyd S. Bryce, Paymaster-General, May 25, 1887.

Lieutenant-Colonels.

Thomas H. Barber, Assistant Adjutant-General 1st Brigade, Oct. 5, 1887.
Alexander S. Bacon, 23d Regiment, Oct. 25, 1887.

Majors.

Henry A. Allen, Supernumerary, Feb. 10, 1887.

Captains.

Samuel G. Blakley, 71st Regiment, Jan. 14, 1887.
Geo. A. Williams, 65th Regiment, Feb. 1, 1887.
William L. Best, 35th Separate Company, Feb. 1, 1887.
Thos. A. McBain, 71st Regiment, Feb. 16, 1887.
Rhesa Griffin, 40th Separate Company, March 3, 1887.
Leander V. Roberts, 47th Regiment, March 8, 1887.
Charles A. Hess, Inspector Rifle Practice, 71st Regiment, July 18, 1887.
Alfred Chamberlain, 9th Regiment, Aug. 18, 1887.
Fred. W. Gwyer, Assistant Surgeon, 71st Regiment, Sept. 19, 1887.
Marvin R. Vincent, Chaplain, 71st Regiment, Sept. 19, 1887.
Eugene Root, 26th Separate Company, Nov. 17, 1887.
James De Mandeville, 13th Regiment, Dec. 14, 1887.
Walter S. Colton, Supernumerary, Dec. 21, 1887.

First Lieutenants.

Louis N. Post, 29th Separate Company, February 1, 1887.
George B. Wood, 41st Separate Company, February 1, 1887.
Robert A. Sewell, 71st Regiment, February 10, 1887.
Frederick E. Fowler, 65th Regiment, February 18, 1887.

Frank H. Carr, 65th Regiment, April 1, 1887.
Geo. M. Brink, 14th Separate Company, April 1, 1887.
Arthur E. Schumann, 11th Regt., May 11, 1887.
Myron S. Watkins, Asst. Surgeon, 26th Separate Co., May 20, 1887.
William H. Bradish, 74th Regiment, June 24, 1887.
Charles E. Brown, Quartermaster, 71st Regiment, July 20, 1887; appointed January 4, 1887.
George L. McAlpin, Commissary of Subsistence, 71st Regt., July 20, 1887; appointed Jan. 4, 1887.
Emil A. Bracklow, Assistant Surgeon, 2d Battery, Sept 19, 1887.
Albert R. Gumberts Assistant Surgeon, 8th Separate Company, Sept. 19th, 1887.
Henry C. Clark, Adjutant, 13th Regt., Oct. 19, 1887.
Elmer E. Seaman, 65th Regiment, November 7, 1887; appointed Feb. 21, 1887.
William H. Hicks, Jr., 65th Regt., Nov. 15, 1887; appointed Feb. 7, 1887.
William E. Cook, 9th Regt., Nov. 30, 1887.
A. E. Woolf, Commissary of Subsistence, 11th Regt., Nov. 30, 1887.
Dillon F. Acker, Assistant Surgeon 29th Separate Company, Dec. 9 1887.

Second Lieutenants.

James A. Wight, 71st Regt., Feb. 16, 1887,
Charles L. Speir, 13th Regt., Feb. 16, 1887.
Charles F. Hicks, 47th Regt., March 8, 1887.
Robert J. Knox, 30th Separate Company, March 24, 1887.
Charles Brittain, 15th Separate Company, April 27, 1887.
Frederick E. Tanner, 65th Regt., June 24, 1887.
William J. Leonard, 14th Regt, Aug. 2, 1887.
John Cadwell, 13th Separate Company, Nov. 7, 1887; appointed May 31, 1887.
John V. Carr, 65th Regt., Nov. 15, 1887.
Alfred E. Seliger, 11th Regt., Nov. 30, 1887.
William H. Plumb, 27th Separate Company, Nov. 30, 1887.
James W. Reed, 18th Separate Company, Dec. 9, 1887.
Edward S. De Forest, 65th Regt., Dec. 21, 1887; appointed Feb. 7' 1887.

RENDERED SUPERNUMERARY.

Colonel William Judd Denslow, Inspector 2d Brigade, June 21, 1887.
Lieut.-Col. Albert L. David, Assistant in Dept. Rifle Practice, Dec. 12, 1887.
Major Jacob Spahn, Engineer, 12th Brigade, April 2, 1880.
Major W. G. Vought, Commissary of Subsistence, 8th Brigade, Aug. 5, 1886; not accepted new appointment.
Captain Julius T. Herbold, on duty with 65th Regiment, Oct. 20, 1887.
Captain B. J. Hornbeck, 14th Separate Company, Dec. 28, 1887.
Captain Joseph H. Gerner, 24th Separate Company, March 2d, 1887.
Captain Henry A. Menker, Inspector Rifle Practice, 65th Regt., Nov. 1, 1887.
Captain James E. Sharp, 4th Battery, Feb. 16, 1887.
First Lieutenant Samuel Sexton, 4th Battery, Feb. 16, 1887.
First Lieutenant John M. Tillinghast, 24th Sep, Com., March 2, 1887.
Second Lieutenant Gilbert W. Jewett, 4th Battery, Feb. 16, 1887.
Second Lieutenant Jeremiah O'Connor, 24th Separate Com., March 2, 1887.

CASHIERED BY SENTENCE OF GENERAL COURT-MARTIAL.

First Lieutenant Russell Benedict, 13th Regt., May 4, 1887, G. O. No. 18, A. G. O. c. s.
Second Lieutenant Wm. K. Smith, 13th Regt., April 18, 1887, G. O. No. 16, A. G. O. c. s.

NOT ACCEPTED.

Major Wm. G. Vought, Supernumerary Commission as Commissary of Subsistence, 4th Brigade.

DISCHARGED UNDER THE PROVISIONS OF MILITARY CODE, 25.

Captain J. Bryant Lindley, Asst. in Quartermaster Dept., Dec. 21, 1887.

DISCHARGED UNDER THE PROVISIONS OF MILITARY CODE, 46.

Colonel Thomas S. Waud, 65th Regiment, March 3, 1887, S. O., No. 17, ¶ 5, A. G. O.
First Lieutenant Wm. H. Gornee, 26th Separate Company, February, 1, 1887, S. O., No. 7, ¶ 1, A. G. O.
First Lieutenant Roland de V. Parker, 11th Regiment, March 3, 1887, S. O., No. 17, ¶ 3 A. G. O.
Second Lieutenant Geo. A. Crispin, 26th Separate Company, January 26, 1887, S. O., No. 6, A. G. O.
Second Lieutenant Wm. H. Toshach, 3d Battery, March 3, 1887, S. O., No. 17, ¶ 2, A. G. O.

DISCHARGED UNDER THE PROVISIONS OF MILITARY CODE, 43.

Captain Howard F. Kennedy, 9th Regiment, June 10, 1887, S. O., No. 49.
First Lieutenant Edwin W. Burrage, 12th Separate Company, April 13, 1887, S. O., No. 33, ¶ 2.
First Lieutenant Wm. Goedel, 32d Regiment, May 25, 1887, S. O., No. 44, ¶ 4.

DIED.

Major Lawson B. Bell, Supernumerary officer, August 20, 1887.
Captain George Gustow, 8th Regiment, January 22, 1887.
Captain David Moffatt, Jr., 23d Regiment, March 31, 1887.
Captain James G. Wallace, I. R. P., 69th Regiment, April 14, 1887.
Captain Chas. P. Kretschmar, 13th Regiment, June 9, 1887.
First Lieutenant Louis A. Bleuderman, Quartermaster, 32d Regiment, January 27, 1887.
Second Lieutenant Edward F. Young, 7th Regiment, December 21, 1887.
Chaplain Henry Ward Beecher, 13th Regiment, March 8, 1887.
Chaplain John Meury, 32d Regiment, May 19, 1887.
Chaplain Sullivan H. Weston, 7th Regiment, October 14, 1887.

CHANGES IN ORGANIZATION.

Organized.

24th Separate Company, Middletown, March 17, 1887, S. O., No. 23, A. G. O.
43d Separate Company, Olean, March 17, 1887, S. O., No. 24, A. G. O.
44th Separate Company, Utica, September 13, 1887, S. O., No. 82, A. G. O.

Disbanded.

4th Battery, Troy, February 16, 1887, S. O., No. 12, A. G. O.
24th Separate Company, Utica, March 2, 1887, S. O., No. 16, A. G. O.

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(B.)

REPORT ON STATE CAMP.

By Col. E. F. Townsend, Twelfth United States Infantry, and
Major R. Lodor, Third United States Artillery.

Madison Barracks, N. Y., *July* 8, 1887.

Adjutant-General, U. S. Army, Washington, D. C.:

Sir.—In obedience to paragraph 15, Special Orders, No. 125, current series, headquarters of the army, Adjutant-General's office, and letter of instructions from Adjutant-General's office, dated June 2, 1887, I have the honor to report herein the result of my inspection and observation of so much of the National Guard, State of New York, as was on duty at the State Camp of Instruction near Peekskill during the period from June 18 to July 5, 1887.

I left Madison barracks June seventeenth, arriving at the camp the fellowing morning. The camp of instruction at or near Peekskill is a military post, having been so constituted by General Orders, No. 20, General Headquarters, State of New York, Adjutant-General's office, Albany, May 16, 1887. The post commander is Major-General Josiah Porter, Adjutant-General of the State, and who is assisted by a very complete and efficient staff.

The garrison of the post consisted of the regiments and other organizations ordered into camp for one week's service, and then relieved by others for an equal length of time.

The camp is situated upon a high plateau, on the east bank of the Hudson river, commanding a beautiful view down the river, and is about four miles by road from the town of Peekskill. The property comprises about 137 acres, and belongs to the State, having been purchased for military purposes. Great improvements have been made from year to year; and others are contemplated for the future. Since last summer a thorough system of sewerage has been established, water-closets and bath-houses constructed, and the drainage of the camp generally made complete. Its sanitary condition has been made as perfect as skill and money can render it.

SUBSISTENCE DEPARTMENT.

The troops were messed by contract. A large building, capable of seating nearly or quite 900 persons, has been built for a mess-hall, and includes a commodious kitchen with steam-cooking apparatus. A corps of skilled waiters was in attendance. Three times each day the troops were marched to the mess-hall, where were found awaiting them substantial meals, excellently cooked. I heard of no fault whatever being found, and the arrangements reflect great credit upon the officers who designed the system and the contractors who carried it into effect. Ration returns were made out daily for the number of men in camp, sent to the post-adjutant, and if found correct were approved, and orders issued for the number of meals required.

QUARTERMASTER'S DEPARTMENT.

The chief of ordnance, Brigadier-General Joshua Varian, also acted as quartermaster-general. Under his supervision all the improvements were made and the camp ground put in readiness for the reception of the troops. Tents were pitched, floored, furnished with cots, mattresses, blankets, and other necessary articles before the arrival of the troops. All articles of quartermaster property were regularly turned over by the acting quartermaster-general to the regimental quartermaster, receipted for by the latter, and then at the end of the week transferred again to the acting quartermaster-general to be reissued to the next regiment to arrive.

The tentage was in excellent order, made of heavy duck, wall-tents for the men and line officers, and a wall-tent and hospital-tent for each field officer. Transportation of the troops was by contract with railroad companies and steamboats, and all troops arrived and departed upon schedule time.

MEDICAL DEPARTMENT.

The medical department was under the general supervision of Surgeon-General J. D. Bryant. He, however, visited the post at intervals, making careful inspections when he did come. In the meantime the senior surgeon of the regiment was post surgeon. He made frequent inspections, generally twice each day, and reported to the post commander all matters that needed attention.

There was but little sickness in camp, and that of a temporary nature.

Ordnance Department.

Ammunition was issued to the troops for skirmish and volley firing, and cannon cartridges for firing the morning and evening gun and for salutes. Beyond this there appeared to be little or nothing for the officer in charge of this department to do.

A detachment of First Battery New York State Artillery was detailed to take charge of and fire the field-pieces.

Target Practice.

There was no target practice at this camp; all this work is done at Creedmoor, and at other times of the year.

The Troops — The Seventh Regiment, New York National Guard.

The first regiment to appear in camp was the Seventh, from the city of New York, which marched into camp about 3.30 p. m., June eighteenth, under command of Colonel Emmons Clark. The strength of this regiment, present and absent, is forty commissioned officers and 968 enlisted men — aggregate, 1,008. There were present in camp the morning of June nineteenth, thirty-six officers and 734 enlisted men — aggregate, 770. The average strength during the week was 683 enlisted men; the number of officers remaining about the same as at arriving.

The uniform of the Seventh is well known, assimilating as it does so closely to the uniform of the United States Corps of Cadets. The regiment wore, also, a gray blouse for undress uniform, and a gray shell-jacket and forage-cap. The helmet worn is white, with the usual ornaments, making it altogether too heavy for summer wear. This gray uniform is characteristic of this regiment, having been its distinctive dress for many years. It is no doubt very serviceable, but I think that when the regiment is called out by State orders it should be required to wear the State uniform. Upon other occasions the regiment could wear the gray uniform, should it desire so to do, with propriety.

Arms and Equipments.

The arms of this regiment, as well as of all the other regiments of the New York National Guard, are Remington rifles, caliber fifty. The Remington seems to be preferred to the Springfield, but I think it important that the arms should be of the same caliber as the government arm, if not of the same pattern. The arms appeared to be in excellent order and serviceable.

The cartridge-box generally used on drill was the Frazier patent,

with black waist-belts. The one used on dress occasions was of a very old style, and slung upon the right hip by means of a white webbing shoulder-belt.

They also carried the old glazed knapsack, kept in shape by a wooden frame-work — a very poor affair and of but little use.

I saw no canteens or haversacks with this regiment.

DISCIPLINE.

Generally the discipline in this regiment was good. Military courtesy was scrupulously observed, and all orders were obeyed promptly and with apparent willingness.

INSTRUCTION.

After the first two days a marked improvement was manifest, particularly in the ceremonies. Guard mounting and dress parades became nearly perfect. The adjutant, however, habitually posted himself much too far to the front at guard mounting — in fact, nearly at the point he would take for dress parade.

In the drills numerous errors occurred from time to time, but they were carefully corrected by the instructor, and a decided improvement was shown toward the last.

Guard duty, in some respects, was well done; in others less so. There was too much conversation between contiguous sentries, and the posts were not walked with that spirit and alertness that is desirable.

The formation of the line of battle at parades was too hurried. The companies moved out from their company streets nearly or quite simultaneously, and appeared upon the line nearly at the same moment; several, in consequence, were obliged to mark time until an opportunity occurred to move to place. A little more time taken would have avoided this, and the appearance would have been considerably improved. The marching in battalion drill and parades was excellent, the manœuvres fairly well done; skirmish drill not so well, but considerable improvement in both drills was exhibited toward the last.

The manual of arms at guard mounting and dress parade toward the latter part of the week was as near perfection as soldiers are likely to get, and quite as good as is desirable; but at the company and battalion drills the same attention was by no means paid to this point.

The police of the camp ground was simply perfect. I have never before seen so clean a camp.

Take it all in all this regiment deserves great praise, and well sustained its fine reputation.

At about 4 P. M., June twenty-fifth, this regiment marched out of camp and took steamer for New York city, and the Twelfth regiment, which had arrived, occupied the ground.

THE TWELFTH REGIMENT, NEW YORK NATIONAL GUARD.

This regiment was fully equipped with knapsacks, haversacks, canteens, and presented a soldierly appearance as it marched into camp. It is commanded by Colonel James H. Jones, formerly an officer of the Fourth United States Cavalry. Its lieutenant-colonel is Heman Dowd, formerly of the Third United States Artillery, both graduates of the United States Military Academy.

The strength of the regiment, present and absent, is thirty-five officers and 654 enlisted men — aggregate, 689. The number present June twenty-sixth was twenty-nine officers and 528 enlisted men — aggregate, 557.

The average strength during the week was 526 enlisted men; officers, twenty-nine. In addition to the regiment were two separate companies, one the Seventeenth Separate Company from Flushing, Long Island, and the other the Thirty-fifth Separate Company from Ogdensburgh, New York. These companies were attached to the regiment for the purposes of this camp, and lettered L and M, respectively. The Seventeenth Separate Company (L) numbered two officers and thirty-two enlisted men; the Thirty-fifth Separate Company (M) two officers and sixty-five enlisted men.

It was soon seen that the number of raw men in this command was very large, and I learned upon inquiry that by far the largest portion had been enlisted since the last tour of the regiment in camp, two years ago. Indeed, the Ogdensburgh company has been organized little more than a year. Nevertheless, the troops went to work with great zeal and showed that all that was needed was time and good instruction.

UNIFORM.

The uniform of this regiment is the State uniform, and conforms very nearly to the uniform of the regular army, as worn before the adoption of the white trimmings, except that the coat is double-breasted and the privates wear the stripe on the trousers. The uniform is entirely serviceable, but the coat is too heavy. A single-breasted coat would be much better, and I think this is generally recognized. The helmet worn is the white one, such as is worn by regular soldiers in hot climates; no ornaments.

ARMS AND EQUIPMENTS.

The arms and equipments were as described for the Seventh regiment; the Frazier cartridge-box only being used. The condition of arms and equipments was substantially the same as in that regiment.

DISCIPLINE.

I should describe this regiment as being thoroughly amenable to discipline, and that any apparent lack of it was due to ignorance rather than intent. Military courtesy was very largely observed, yet there were many instances in which it was lacking. I noticed, however, that such matters were always corrected when observed by the officers, and in a few days it became exceptional to note a lapse in this respect. The men were willing to learn and obedient in executing orders. At night, after taps, the camp was uniformly quiet.

INSTRUCTION.

The instruction of the regiment cannot be said to be very good, though it is rapidly improving. It has most capable field officers and an excellent adjutant, who are doing efficient work, but many of the line officers are not yet up to the mark. Drills (company, battalion and skirmish) were constantly kept up, each drill showing a good advance over the preceding one.

Wednesday, June twenty-ninth, an experimental battalion skirmish-drill took place under the supervision of Lieutenant G. N. Whistler, Fifth artillery, United States Army, who came from New York harbor for the purpose. It was intended to demonstrate how our present infantry tactics can be adapted to the present conditions of modern warfare. The battalion was formed in column of divisions. Deployment was made from the head of the column, each division having a small reserve. Successive divisions were thrown forward and the advance made by rushes, the leading line being reënforced by those in rear. When about 150 yards from the objective point, the final reserve of the battalion in line-of-battle, with fixed bayonets, charged up to the enemy's works, carrying with it the heavily reënforced firing-line. Though, no doubt, there are grave defects in this method, yet they are due to the inherent defects of our present system of tactics, and in my opinion this is an excellent method of instructing a battalion in skirmishing so long as we are obliged to retain our present tactics. Although but one deployment was made, the men caught the idea quickly and the drill may be said to have been fairly successful. This drill was repeated over a broken and wooded country two days after, and was very satisfactory in its results.

Dress parades and guard mountings were very well executed, and after the first day or two with invariable correctness. The manual of arms, though by no means perfect, was very good at all ceremonies. At drills the same close attention to exactness did not obtain. Sentry duty was fairly well performed, generally, though on account of a large number of raw men numerous errors occurred from time to time. The police of the camp during the tour of this regiment could not have been improved.

Saturday, July second, at 5 o'clock P. M., the steamers from New York having arrived, this regiment marched out of camp. The magnificent appearance of the regiment as it moved off drew commendation from all on-lookers, and clearly demonstrated the value of the week's work. It showed what can be done in a comparatively short time with good material when handled by efficient officers.

THE NINTH REGIMENT, NEW YORK NATIONAL GUARD.

As the Twelfth regiment moved off the Ninth regiment moved into camp. This regiment is commanded by Colonel William Seward, and was equipped with haversacks, knapsacks, and canteens; wearing the State uniform with black helmets. Its strength, present and absent, is thirty-two officers and 553 enlisted men — aggregate, 585. July third its strength present in camp was thirty officers and 363 enlisted men — aggregate, 393. Shortly after the arrival of this regiment four separate companies marched into camp, and were organized into the First Provisional Battalion. This battalion was composed of: The Sixth Separate Company, numbering present and absent four officers and 100 enlisted men; in camp July third, three officers and eighty enlisted men. Eleventh Separate Company, present and absent four officers and fifty-two enlisted men; in camp three officers and thirty-five enlisted men. Thirty-eighth Separate Company, present and absent two officers and sixty-seven enlisted men; in camp two officers and forty-nine enlisted men. Forty-first Separate Company, present and absent four officers and sixty-eight enlisted men; in camp three officers and fifty-three enlisted men. Aggregate, present and absent, fourteen officers and 287 enlisted men; in camp eleven officers and 217 enlisted men.

The battalion was placed under command of Major Jones, Eleventh regiment, who was supplied by detail with the necessary commissioned and non-commissioned staff. The troops arriving in camp so late, the usual dress parade was dispensed with.

Sunday morning, July third, the First Provisional Battalion was formed for battalion inspection. It was observed at once that it was

entirely new to all, and numerous errors were made. So far as I observed the Ninth regiment had no inspection.

Having received a copy of Special Orders, No. 149, paragraph I, current series, Headquarters of the Army, Adjutant-General's Office, by which Colonel Clermont L. Best, Fourth United States Artillery, was directed to relieve me from further duty at the State Camp of Instruction, and Colonel Best having arrived, ready for duty July fifth, I gave him such information as seemed requisite, and departed for my station. I, therefore, leave to him to make a report as to the condition and acquirements of the Ninth New York National Guard and the First Provisional Battalion.

Before closing this report I desire to express my warmest acknowledgements of the great courtesy and attention shown me by General Porter, General Varian, Colonel Phisterer, the post adjutant, and indeed by every officer connected with the post staff. They made my sojourn of two weeks most pleasant, and it was with great regret that the necessity of making preparations to move with my regiment to the west rendered it imperative that I should leave before the termination of the entire camp tour.

I am, sir, very respectfully, your obedient servant.

E. F. TOWNSEND,
Colonel Twelfth Infantry.

BARRACKS, WASHINGTON, D. C., *September* 6, 1887.

To the Adjutant-General United States Army, Washington, D. C.:

GENERAL.—In accordance with Special Orders, No. 153, dated Headquarters of the Army, Adjutant-General's Office, July 5, 1887, and in connection with special instructions contained in letter of July seventh, I have the honor to submit the following report of my inspection of that part of the troops of the National Guard, State of New York, in camp at Peekskill, based upon personal daily observation, and covering the period from July 10 to August 6, 1887:

On my arrival July tenth, I found that Colonel C. L. Best, Fourth United States Artillery, who preceded me in this duty, had left early in the morning, but on reporting to the commanding officer I was at once placed in a position to carry out my investigations to their fullest extent, every possible facility being given me.

Examining the reports of officers who have previously been on this duty in connection with the New York troops, I find that the duties of the different departments have been so fully and ably detailed, as

well as the position and character of the camp outlined, that in this respect it leaves but little for me to add. I may state, however, with reference to the camp that improvements are yearly being made, and judging of the work of the future by that of the past, it is my opinion that the time will come when this, as a regimental camp, will be surpassed by none.

The camp was under the command of Major-General Josiah Porter, Adjutant-General of the State.

TROOPS.

On my arrival I found the Forty-seventh Regiment, Colonel Gaylor commanding, comfortably located, as well as the Fifth, Nineteenth and Twentieth Separate Companies, constituting the Second Provisional Battalion.

The average strength was as follows:

Forty-seventh Regiment, July ninth to sixteenth: Present, twenty-four officers and 307 men; present and absent, twenty-six officers and 426 men; absent without leave, one officer and ninety-nine men.

Fifth Separate Company, July ninth to sixteenth: Present three officers and sixty-two men; present and absent, three officers and sixty-seven men; absent without leave, three men.

Nineteenth Separate Company, July ninth to sixteenth: Present, four officers and sixty-seven men; present and absent, three officers and seventy-eight men.

Twentieth Separate Company, July ninth to sixteenth: Present, three officers and fifty-four men; present and absent, four officers and eighty men; absent without leave, twenty men.

Twenty-third Regiment, July sixteenth to twenty-third: Present, thirty-five officers and 364 men; present and absent, thirty-eight officers and 654 men; absent without leave, one officer and 258 men.

Seventy-first Regiment, July twenty-third to thirtieth: Present, twenty-eight officers and 379 men; present and absent, thirty-two officers and 551 men; absent without leave, three officers and 165 men.

Tenth Battallion, July twenty-third to thirtieth: Present, fifteen officers and 177 men; present and absent, seventeen officers and 245 men; absent without leave, two officers and sixty men.

Twenty-second Regiment, July thirtieth to August sixth: Present, thirty-seven officers and 447 men; present and absent, forty officers and 546 men; absent without leave, one officer and seventy-four men.

Second Battery (Gatlings), July thirtieth to August sixth: Present, three officers and seventy-four men; present and absent, four officers and 101 men; absent without leave, twenty-four men.

STRENGTH.

The reports of the inspector-general for 1886 (printed in the Adjutant-General's report for 1887) show the aggregate strength of the National Guard of the State of New York to August 9, 1886, to be 12,425, sub-divided as follows: General and staff officers, forty-eight; artillery, 461; infantry, 11,916; total, 12,425.

EQUIPMENTS.

The arms and equipments are fully referred to in the report of Major R. H. Jackson, Fifth artillery, brevet brigadier-general, United States Army, for 1886, and no change has been made. The uniform is the same as mentioned by General Jackson. Neither General Schaefer, the inspector-general, nor General Jackson, approve the double-breasted coat for active service, but recommend a blouse. General Schaefer says that he thinks experience has fully proven to be requisite a neat-fitting, substantial, five-button cloth blouse, and I agree with him. The clothing was in excellent condition. I may say the same for the equipments.

INSTRUCTION.

General Orders, No. 4, Headquarters State of New York, Adjutant-General's Office, Albany, February 1, 1887, requires that the commanding officers of brigades, regiments and battalions establish schools of instruction for the officers of their respective commands; that the commanding officers of batteries and companies establish schools of instruction for the non-commissioned officers of their respective commands. Reports are required, but so far they have not been sent in accordance to the order. The next report of the Adjutant-General of the State will doubtless show whether the order has been obeyed. In camp, so far as I could find out, the instruction was carried out. In addition to the above, Colonel Phisterer, the acting assistant adjutant-general, not content with watching daily every detail, like a thorough soldier, would call in the first sergeants and the non-commissioned staff and thoroughly instruct them in the routine of their duties, explaining with great care the proper manner of conducting their office work. On one occasion this was omitted for cause, and I was much surprised to find how mixed the office work and, in fact, other work was in consequence.

The day previous to marching on guard the entire detail was called together and the duties and the manner of performing said duties were thoroughly explained and illustrated. The duties of sentinels, particularly, were rehearsed again and again with an untiring vigilance; and if they were not finally understood it was certainly not the

fault of the instructors. The inspector of drills watched with a critical eye for mistakes. A daily report of these was submitted to the commanding officer, and by him, with remarks, to the officers concerned, who, if they so desired, could correct them at the next drill.

DRILLS.

The military exercised, executed and practiced in camp consisted generally of such tactical movements as could not be carried out in armories; morning company drills from 5.45 to 7; battalion drill from 9.25 to 11.30 A. M.; guard mounting intermediate with the drills; dress parade daily at sunset; no competitive drills allowed. The marching and step were admirable; manœuvres well performed generally. The chief difficulty was with the guides, who did not know their duties. In many cases neither the field nor staff officers seemed capable of posting them; at all events they failed to do so. It was the same with reference to the sergeant majors. I can, however, refer with pleasure to one major and one adjutant who did understand and did post guides and rectify mistakes.

The men manifested much spirit in their drills, and although the battalion drills were hard, hot and long continued, I found no disposition to grumble, every one doing his share willingly. The drill of the Twenty-third, under Lieutenant-Colonel Bacon, was exceptionally hard and rapid. A few of the subdivision commanders and one battalion commander failed in a knowledge, more or less, of their duties. The errors became less from day to day, and, with one exception, the commands made rapid improvement. The last drills were nearly perfect technically, and, generally, the last parade and guard mount were quite so.

No target firing during encampment.

STAFF DEPARTMENTS.

The Adjutant-General's office, under charge of Colonel Fred. Phisterer, was a model. The routine of service, including passes and papers of all kinds, was quietly perfect.

The supply departments, under General Varian, and his hard-working assistant, Colonel Story, are in good shape. The details of these have been given, as well as those of the medical and pay departments, in Colonel Closson's (1885) and General Jackson's (1886) reports.

No regular inspection of the troops took place. Lieutenant-Colonel McLewee, assistant inspector-general, represented the department, and in the inspection of the camp and kindred work he was excellent. The inspector of guards, Captain Thurston, and the inspector of drills, Captain Stacpole, knew their business and attended to it thoroughly.

DISCIPLINE.

I find it stated by others that military courtesy was, as a rule, strictly observed, and I found it so. The men were respectful and obedient. No nonsense, intoxication, noise, or luxuries were found in camp, and after taps, even on the last night, the greatest quiet prevailed. The officers and men were required to wear their uniform at all times, and when outside the tent or company streets coats had to be buttoned, and this was general from the commandant down. Guard duty was well performed. Grand rounds every night. In my tours I found the men and officers well posted; all they required was a little more experience. The police of the camp was nearly perfect. On one occasion I considered it as perfect in the body of the camp. This careful policing extended throughout the entire grounds. The discipline reached even the band; their behavior was excellent, and tents and grounds in good order. The sanitary condition was superb

GENERAL REMARKS.

The commander-in-chief is to be congratulated on the excellence of the National Guard of the State of New York, if the commands I had the honor of visiting are to be taken as a true sample of the rest. General Porter, in his quietly energetic way, is pursuing the proper course to place the National Guard in a true soldierly condition. If his orders are carried out, or rather if he can have them enforced, I can't see what more can be desired in infantry movements. It was a matter of surprise to me to find how tactically everything went. The few faults I have mentioned are the only ones to be rectified, unless I add that the first sergeants exact more implicit obedience to their orders and the file-closers exercise more authority.

I have to thank General Porter and his staff for their exceedingly kind and courteous treatment, and I may add that I spent a profitable month at the Camp of Instruction of the National Guard of the State of New York.

I am, sir, very respectfully, your obedient servant.

R. LODOR,
Major Third Artillery.

(C.)

GENERAL ORDERS, CIRCULARS AND OPINIONS OF THE JUDGE ADVOCATE-GENERAL.

STATE OF NEW YORK:

OFFICE OF THE JUDGE ADVOCATE-GENERAL,
STEWART BUILDING, 280 BROADWAY,
NEW YORK, *March* 10, 1887.

Major-General JOSIAH PORTER, *Adjutant-General State of New York:*

SIR.—I have the honor to acknowledge the receipt of a communication addressed, under date of February 12, 1887, by Lieutenant-Colonel George Moore Smith, of the Seventh regiment, National Guard State of New York, and president of the board of examination of the First brigade, to the assistant adjutant-general of such brigade, and duly forwarded to me for my opinion.

It is stated in this communication that it appears in the examination paper of Martin P. O'Dwyer, a private in Company H, Sixty-ninth regiment, and first-lieutenant-elect of that company, that he is not a citizen of the United States, and that the board of examination thought it proper, in view of this circumstance, to suspend and adjourn his examination in order to secure an opinion as to "whether, in the light of the provision of the Code upon the subject, it is within the province and power of the board of examination to disqualify the candidate as ineligible for the cause stated, and whether that question should be left for the action of the Commander-in-Chief."

The powers and duties of the board of examination are defined in M. C. 24, which provides that, with the exception of general officers and certain staff officers, no commission shall be issued until the officer elected or appointed shall have passed "a satisfactory examination before a board as to his moral character, his general knowledge of military affairs, proportioned to the office to be held, and his fitness for the service."

The examination to be had before the board is thus directed to three points: First, moral character; second, general knowledge of military

affairs; and third, fitness for the service. A more detailed statement of the subjects to be covered in this examination is to be found in R. 608–613 inclusive; R. 611–613 defining the subjects for examination to test the applicant's knowledge of military affairs, and R. 610 in a measure defining the expression "fitness for the service."

The power of the board to disqualify an officer under examination is, in my judgment, limited to the cases where he shall fail to pass a satisfactory examination upon one of the three general subjects mentioned in M. C. 24 and enumerated by me above. The question of citizenship is dealt with in the first sentence of M. C. 24, which provides that all commissions shall be issued by the Commander-in-Chief, and that no person shall be commissioned unless he is a citizen of the United States, eighteen years of age or upward. This provision as to citizenship, it will be observed, is immediately connected with the authority given to the Commander-in-Chief to issue commissions, and the eligibility of a candidate appointed or elected to office, in the matter of citizenship, is one to be determined by the officer who is to issue the commission.

It does not follow from what I have said that the board has no authority to inquire either orally or by answers to printed questions, such as are contained in the formal blank transmitted with the communication now before me, as to the place of birth and citizenship of a candidate. On the contrary, any and all facts bearing upon the past history and life of the candidate, his place of business, the nature of his business, his age, date and place of birth, and time of becoming a citizen, if not born here, are matters which may be properly inquired about in order to enable the board to satisfactorily dispose of those questions which by the express language of the M. C. 24, they are called upon to determine. They have the right to be fully informed as to the candidate's past history, and such information may not only be proper but absolutely necessary to enable them to pursue inquiries or summon witnesses before them as to his character and habits. If in reply to the question as to his citizenship there is any reasonable doubt as to the applicant's possessing this requirement, the board should, in my judgment, suspend the further examination of the applicant, as they have done in the present case, and refer the question to the Commander-in-Chief. In such a case it is not necessary, in my opinion, that the board should proceed with an examination when at the outset they are put into possession of facts which render it highly probable that the candidate cannot receive his commission for lack of qualifications other than those upon which the board is to examine. To pursue

such a course would result in a great waste of valuable time, and accomplish no good result.

I have the honor, therefore, to advise that the board of examination have not the power to disqualify a candidate for the reason that he is not a citizen of the United States. The board should, in such a case, suspend the candidate's examination, certify to the Commander-in-Chief the facts of which they have knowledge, and request a direction from him as to whether the examination shall be proceeded with.

I have the honor to remain, very respectfully yours.

WM. M. IVINS,
Brigadier-General and Judge Advocate-General.

STATE OF NEW YORK:

OFFICE OF THE JUDGE ADVOCATE-GENERAL,
STEWART BUILDING, 280 BROADWAY,
NEW YORK, *May* 13, 1887.

Major-General JOSIAH PORTER, *Adjutant-General, N. G. S. N. Y.:*

SIR.—I have considered the question submitted to me as to whether a commission can lawfully issue to Martin P. Dwyer as first lieutenant in the Sixty-ninth regiment, National Guard.

The facts, as they appear before me, are that Martin P. Dwyer enlisted in the Sixty-ninth regiment in October, 1883; declared his intention to become a citizen in January, 1884, and after holding successively the offices of corporal and first sergeant in his regiment, was at his own request reduced to the ranks, and thereafter elected first lieutenant of Company H, in December, 1886. He is admittedly not a citizen, and that fact appearing upon the the preliminary examination by the brigade examining board, the question of the eligibility of Private Dwyer for the office to which he has been elected has been certified to the Commander-in-Chief for his decision.

M. C. 24, directs that all commissions shall be issued by the Commander-in-Chief, and that no person shall be commissioned "unless he is a citizen of the United States, eighteen years of age or upward." This language is free from ambiguity and appears to be decisive of the question before me.

It is argued, however, on behalf of Private Dwyer that the provision just quoted is inconsistent with the last sentence of M. C. 40, and that this latter provision should govern.

The language in section 40, to which reference is thus made, provides that "every enlisted man shall continue to be held to duty and

shall retain rank and be eligible to promotion after the expiration of his term of enlistment or re-enlistment, until he is actually discharged." This is the concluding sentence of a section which deals with the term of enlistment and the qualifications of recruits. The object which the Legislature had in view in using this language seems entirely plain. It was to determine the legal status of soldiers who continued in service after the expiration of their term of enlistment or re-enlistment.

It is conceded that the language quoted from M. C. 40, does not in terms apply to the case before me, inasmuch as Private Dwyer has not yet served out his term of enlistment. It is argued, however, that the expression "eligible to promotion" means unlimited promotion; that it is not to be assumed that M. C. 40, intended to confer on soldiers serving after the expiration of their term of enlistment greater rights than they would possess before the ending of such term, and that, therefore, all persons who are enlisted become eligible to promotion without restriction.

Conceding so much of this argument as asserts there should be no difference in the right to promotion between soldiers serving before and after the expiration of their term of enlistment, the conclusion deduced therefrom does not necessarily follow. There is no direct assurance of unlimited promotion. A promise in general terms such as is found in the last sentence of M. C. 40, cannot be claimed to be inconsistent with the restrictions contained in M. C. 24. It is a primary rule of construction that effect shall be given to all parts of a statute where it is possible to do so. In the present case this result can be attained by holding that the promotion to which the soldier is entitled is limited, if he be an alien, to holding non-commissioned offices. This construction gives full effect to the clear and precise language of M. C. 24, debarring aliens from holding commissions, and at the same time gives effect to any rule of law existing by express provision or by statutory construction which assures to an enlisted man promotion.

In the consideration of the question submitted I have had the assistance of the brief filed by Captain Hugh Coleman, of the Sixty-ninth regiment, in which the case of Private Dwyer has been fully presented.

I have the honor, therefore, to advise that no commission can lawfully issue to Private Dwyer as first lieutenant, and that he was not eligible to that office at the time of his election, by reason of his lack of citizenship.

I have the honor to remain, very respectfully yours.

WM. M. IVINS,
Brigadier-General and Judge Advocate-General.

STATE OF NEW YORK:

OFFICE OF THE JUDGE ADVOCATE-GENERAL,
STEWART BUILDING, 280 BROADWAY,
NEW YORK, *June* 20, 1887.

Major-General JOSIAH PORTER, *Adjutant-General, N. G. S. N. Y.:*

SIR. — I have the honor to acknowledge the receipt of a communication from you under date of May 20, informing me that Theodore M. Barber, formerly captain of the Forty-second Separate Company, was rendered supernumerary by the disbandment of that organization February 15, 1883; that he has recently been elected to the command of another company, and now makes application to have granted him his original rank as captain (Oct. 16, 1877); that he had never reported to your office as a supernumerary officer, but on the 9th of May forwarded reports covering the years 1883, 1884, 1885 and 1886, and inquiring whether, under the circumstances, Captain Barber is entitled to his old rank.

The M. C. does not supply any complete definition of the word supernumerary. It leaves the status of officers who have been rendered supernumerary to be determined by a construction of its various provisions. In endeavoring to determine the intent of the Legislature in this behalf as expressed in the M. C., the position which such officers have been accorded by previous legislative and constitutional enactments will be of assistance.

By the Constitution of 1777, article 24, it was provided "that all military officer be appointed during pleasure," and "that all commissioned officers, civil and military, be commissioned by the Governor." The amendment of 1801 simply declared that the power of appointment was vested concurrently in the Governor and the members of the council of appointment. In the Constitution of 1824, article 4, after providing for the election of line officers and the appointment of staff officers and authorizing the Legislature to direct the time and manner of electing militia officers, the fourth section provided "that the commissioned officers of the militia shall be commissioned by the Governor and no commissioned officer shall be removed from office unless by the Senate on the recommendation of the Governor, stating the grounds on which such removal is recommended, or by the decision of a court-martial pursuant to law," and to regulate the tenure of such officers who had been previously appointed to hold during pleasure, it was further provided that the "present officers of the militia shall hold their commissions subject to removal as before provided." This

fourth section was reënacted in the Constitution of 1846 as section 5 of article 11, and is still in force in the language just quoted. The earlier statutes (chapter 33, Laws of 1778; chapter 8, Laws of 1779), recognize the method of appointment and tenure of office provided by the Constitution of 1777, and chapter 55, Laws of 1780, section 14, directed that all officers then holding office as "under the late government before the revision or under the convention before the present government," and who had since received a new commission for the same office, should take rank from the date of their former commission. Chapter 25 of the Laws of 1786 only provided that all commissions should be numbered and officers of the same grade should take rank according to the numbers marked on their respective commissions; a provision also to be found in the general act of organization, chapter 166, Laws of 1801.

By a general act to organize the militia, passed in 1809, being chapter 165 of the Laws of that year, provision was made for the disbandment of organizations having less than a certain number of members, and by the thirtieth section of the act it was provided that the officers of such disbanded organizations "shall return to the beats, of the several companies within which they severally reside, and be liable to do duty therein." The forty-first section authorized the division or annexation of regiments or companies in brigades, and provided that the officers of the regiments or companies so annexed "shall be exempt from military duty unless they shall be appointed to the command of another regiment or company with the same grade they bore in the regiment or company so attached to such other regiment or company, and shall be entitled to rank by virtue of their former commissions if again appointed."

Another act of organization was passed in 1818, and is known as chapter 222 of the Laws of that year. The first section authorized the Commander-in-Chief to rearrange the existing divisions of the militia and "dismiss supernumerary officers as circumstances may from time to time require." The third section provided that every officer rendered supernumerary by order of the Commander-in-Chief, and by virtue of this act, may either be discharged from militia duty or "at his election retain his rank in the line as a supernumerary officer till a vacancy shall give him a command," such election to be signified by the officer within thirty days after the reception of a notice that he is rendered supernumerary; otherwise he shall be reduced to the ranks.

The general act passed April 23, 1823, (chapter 244, Laws of 1823,) gave the same general authority to the Commander-in-Chief to rear-

range and disband military organizations, and its fourth section was the same as the third section, quoted from the Laws of 1818, with the additional provision that "supernumerary officers shall equip themselves, and those under the rank of colonel shall attend the parades and drill trainings of the officers and non-commissioned officers." This act being passed subsequent to the Constitution of 1821, contains provisions for filling vacancies in office by election.

Upon the revision of the statutes in 1827, the laws relating to the militia were consolidated and formed chapter 10 of part 1. By the ninth section of the second title of this chapter, the provision quoted from the Constitution of 1821, authorizing the commissioning of officers by the Commander-in-Chief and regulating the manner of their removal is reënacted; and it is immediately followed by a provision that sergeant-majors and quartermaster-sergeants and others shall be appointed by regimental commanders by warrant, and shall hold their office during pleasure. The sixth and seventh sections of the fourth title reënact the fourth section of the act of 1823 as to the status of supernumerary officers, and as to the equipment and drilling of those who retain their rank.

Chapter 270 of the Laws of 1846, after regulating the matter of elections and providing for the issuing of commissions and for the exercise of command by the officers highest in rank in divisions, brigades and regiments, adds in the eighth section "all other commissioned officers, except as herein provided, shall be exempt from doing any military duty except in war and insurrection, but entitled to all the privileges now provided by law."

By chapter 290 of the Laws of 1847, relating to the militia other than the first division, the Commander-in-Chief was authorized to nominate to the Senate major-generals to command districts to be created, and it was provided that officers who, at the time of their appointment, held the rank of major-general "shall take rank from the date of their first commission." The twenty-first section of this act gave to supernumerary officers "all the privileges conferred by any preceding law except command," and exempted them from the performance of any military duty except in cases of war or insurrection, provided that within one year they reported themselves to the Adjutant-General as supernumerary.

By chapter 494 of the Laws of 1847 the privileges thus conferred were curtailed by enacting that supernumerary officers shall not be entitled to vote at any election of officers.

By section 6 of chapter 254 of the Laws of 1849, substantially the same status was assigned to supernumerary officers in the first division

By the third section of chapter 307 of the Laws of the same year, the enrollment was directed of supernumerary officers not assigned to duty, but exempting them from service except in cases of war and invasion. Upon their exhibiting to the commanding officer of the district in which they resided a certificate of the Adjutant-General that they had reported themselves at his office "as wishing to retain their rank as supernumeraries," and to obtain such certificate they were directed to furnish a written statement "setting forth their rank and date of commission."

Substantially the same status was conferred on supernumerary officers by the general act of April 17, 1854, chapter 398 of the Laws of that year, the twenty-fourth section of the fourth title, conferring on such officers all the privileges given by any preceding law except command, exempting them from the performance of any military duty except in cases of war, provided only that within one year after being rendered supernumerary they reported to the Adjutant-General as such, and depriving them of the power to vote at elections. This provision was reënacted as section 46 in the general act of 1862, chapter 477 of the Laws of that year. By an amendment to this act contained in section 10, chapter 778 of the Laws of 1869, it is provided that in case of the election of a supernumerary officer to command "he may be commismissioned with rank from the same date as that conferred by his previous commission for like office." This provision was reënacted in section 70 of the Military Code of 1870, chapter 80 of the Laws of that year. The twenty-fourth section of this act exempted supernumerary officers from duty with certain exceptions, provided that within one year from the date of their being rendered supernumerary they reported as such to the Adjutant-General, and further authorized the Commander-in-Chief to assign supernumerary officers who had so reported to the Adjutant-General for active duty, giving them when on such active duty all the privileges, emoluments and immunities to which commissioned officers on active duty were entitled. The seventh section of this act, after authorizing a rearrangement of the military organizations of the State, empowered the Commander-in-Chief "to retire any officer rendered supernumerary by any such alteration," and the ninth section, after authorizing the appointment of officers to complete any organization, provided that "all officers superseded by such appointment shall become supernumerary officers." Provision was also made by the 103d and 104th sections for the appointment of a board to examine into the capacity of officers who had become disabled or unfit and incapable of performing the duties of their offices, and it was enacted that upon the recommendation of the

board thereby created "any commissioned officer who shall have served in the same grade for the continuous period of ten years may be placed on the supernumerary list and withdrawn from active service and command by order of the Commander-in-Chief." Amendments were made to the Code of 1870, but they did not materially change those provisions pertinent to the inquiry now under consideration, and the law remained substantially the same until the enactment of the present Military Code of 1883.

Upon examining this statute, the provisions material to the point under discussion will be found very much the same as those contained in the Code of 1870. Thus the twenty-fourth section requires all officers to be commissioned by the Commander-in-Chief. The length of the commission is not prescribed in terms, but the manner in which an officer can be removed and deprived of his office is defined in section forty-five, and includes the action of the Senate on the recommendation of the Governor, and the decision of a court-martial or an examining board. The twenty-fifth section provides that the commissions of the staff of the Commander-in-Chief shall expire with the latter's term of office, and that assistants to the members of the staff shall hold office during the latter's pleasure. The forty-fourth sectionh contains substantially the same provisions as to the exemption of supernumerary officers from military duty, and as to their assignment to active duty and their privileges when doing such duty as have been quoted from the act of 1870. The forty-seventh and forty-eighth sections are equivalent to the 102d and 103d sections of the act of 1870, authorizing the placing on the supernumerary list of disabled or unfit officers and speaking of them as "withdrawn from active service and command."

Turning to the regulations now in force, the ninth regulation provides that officers shall rank in each grade by date of rank stated in the commission, or failing that, by the date of commission itself. The twenty-fourth regulation relates to the rank of the supernumerary officers assigned to duty and provides that "in the organization to which they are assigned they shall take rank from the date of assignment." The 149th regulation provides that an officer reappointed immediately on the expiration of his term of service or transferred from one organization or staff department to another by election or appointment to an office of the same grade, shall retain his date of rank, excepting that in the case of captains commanding companies, officers of that grade in the regiment or battalion to which the officer was elected shall not be affected thereby without their consent. The 821st regulation provides that a supernumerary officer, when not on

duty, may on proper occasions wear the uniform of the organization in which he last served, omitting the departmental, corps, and numerical designations.

Upon a review of the statutes to which reference has been made, it will be observed that commissioned officers in the early history of the State were, by the terms of the Constitution, commissioned to hold office during pleasure. This provision was done away with in 1821, and the constitutional form then adopted and since followed for the appointment and commissioning of officers and defined in what manner and by what means only they could be deprived of the offices given. These constitutional provisions have been recognized and incorporated in the various statutes from time to time enacted and, as already indicated, are set forth in the present Military Code. Their effect is to secure an officer a commission of which he can only be deprived in certain specified ways, now particularly defined in the forty-fifth section of the present Code.

It does not appear that Captain Barber has ever been deprived of his commission by any of the methods of procedure prescribed by the statutes to which I have referred, or by the Code now in force. He must therefore be treated as an officer in commission. He has not been performing active duty, but the performance of such duty is not essential to the existence of an officer in the service. An officer is in service so long as he is subject to orders. The extent of the duties he performs and of the command he exercises are dependent upon entirely different considerations. There is a broad distinction recognized in the statutes of the United States between the retiring of an officer from active service and his being wholly retired. In the latter case he becomes a civilian (14 Opin. Att'y Gen., 506 ; Winthrop's Dig., 433); in the former case his name is carried on the army register, and it is expressly provided that he remains "subject to the rules and articles of war and to trial by general court martial for any breach thereof." U. S. Rev. Stat., sec. 1256; Tyler vs. U. S., 16 Ct. Cl., 234-5; S. C. 105, V. S. 244.

It will also be observed, upon a consideration of the statutes to which reference has been made, that where a reorganization of the militia has been contemplated more or less general provisions have been made as to the disposition of the officers, who might thereby be deprived of command and of the opportunity of rendering active service. The provisions of the statutes of 1809 and 1818 expressly secure to such officers the rank held by them at the time they were rendered supernumerary. Similar provisions have been quoted from the statutes of 1847 and 1849. So far as these statutes are concerned,

there is nothing to show that an officer by being rendered supernumerary has been deprived of the rank which he then held. On the contrary, he is recognized as subject to military duty under certain circumstances.

The general theory of legislation in this State in the past seems to recognize that an officer rendered supernumerary retains his commission, and when reappointed to command in the same grade should receive the same rank as was previously enjoyed by him. This theory accords with the provisions of the present Military Code, and especially with those which relate to the commissioning and removal from office of commissioned officers, and with those provisions of the regulations to which I have directed attention, and particularly with the 149th regulation, as to the rank of officers transferred from one organization to another, and the 821st regulation, authorizing them to wear a uniform.

The position of officers on the supernumerary list is, in my opinion, well expressed in the language used in the Military Code of 1870 and now found in M. C., 47, which speaks of them as "withdrawn from active service and command." As I have already stated, they are none the less in service; they still hold their commissions, and their rank has been fixed in and by the commissions of which they have never been deprived. This conclusion does not conflict with any of the regulations now in force, so far as I can observe. The 24th and 149th regulations assume only to regulate the rank of supernumeraries in the organization to which they are appointed or transferred, and that is not now in question.

I am of the opinion, therefore, that an officer of the line rendered supernumerary is simply withdrawn from active service and command, and without being deprived of his commission or the rank to which it entitled him, and that where he is by election chosen to an office of the same grade as that in which he is commissioned, he is entitled to retain his old rank in the new commission issued to him.

I have the honor, therefore, to advise that Captain Barber in the commission now to be issued to him is entitled to have his rank as of the 16th of October, 1877.

I have the honor to remain very respectfully yours.

WILLIAM M. IVINS,
Brigadier-General and Judge Advocate-General.

STATE OF NEW YORK:

OFFICE OF THE JUDGE ADVOCATE-GENERAL,
STEWART BUILDING, 280 BROADWAY,
NEW YORK, *August* 25, 1887.

Major-General JOSIAH PORTER, *Adjutant-General, N. G. S. N. Y.:*

SIR.—I have the honor to acknowledge the receipt of a letter addressed to you under date of July 23, 1887, by Captain W. B. Randall, Forty-first Separate Company, N. G., protesting against the issuing of a commission to Captain Barber of the Fortieth Separate Company, with rank as of the 16th of October, 1877.

This protest is presented by Captain Randall under three heads:

First, he details the previous connection of Captain Barber with the National Guard, and his action since he ceased to be in active service upon the disbandment of the Forty-second Separate Company, commanded by him. He charges that Captain Barber showed a lack of interest in and acted contrary to the welfare of the National Guard, and upon these criticisms is based the conclusion that in his opinion Captain Barber should not be commissioned anew with his original rank, to the detriment of officers who have been faithful to the service and have kept their commands in a condition to be of avail in case the State should have need of their services.

If Captain Barber's claim to rank was based on considerations of expediency or was dependent upon the exercise of a discretionary power by the Commander-in-Chief, the statements advanced by Captain Randall might be considered, but Captain Barber's case was disposed of upon the ground that according to military law and the statutes of this State, he had a *right* to his former rank if he chose to assert it.

The second point advanced is, that there is no existing law allowing the issuing of a new commission with date of rank prior to the election of the officer receiving it. Without passing on the soundness of this statement, I do not see its pertinency. The question presented was not as to the issuing of a commission with a date of rank prior to the election of the officer receiving it, but it was whether there was any law which authorized the Commander-in-Chief to deprive an officer holding a commission of the rank which it secured to him. Captain Barber was in the service at the time of his last election, and held a commission in the National Guard. I had the honor to point out, that so long as he held that commission which secured him a fixed rank, he could only be deprived of it by certain recognized legal procedure.

Captain Randall refers to M. C. 44, but I do not understand that he makes any point upon it as it is entirely plain that Captain Barber was not in the present instance "assigned" to duty. He, however, in this connection makes a very important assertion in saying that "the power of the State over him had ceased by his own volition. The State had no further claim upon him. He had elected to divest the State of any claim upon him by neglecting to report, and it is absurd to suppose that he did not at the same time surrender to the State all claims he had upon it by virtue of his commission." In this statement is, in my opinion, contained the fundamental error which underlies Captain Randall's protest. The power of the State over Captain Barber did not cease when he was rendered supernumerary. He still retained his commission and was simply deprived of command. I pointed out in my previous opinion the analogy existing between his situation and that of officers in the regular army who are retired, but not wholly retired from the service, and I directed attention to the provisions of the M. C. and R., which recognize in various ways the facts that he was in commission.

I must further dissent from the proposition advanced by Captain Randall that an officer holding a commission can withdraw from the service of the State and free himself from liability to military law simply by an "election" on his part to divest himself of the obligations imposed by his commission. Such a doctrine is at variance with settled principles of military law (A. W. 49) and would be destructive of discipline.

On the third point Captain Randall repeats his previous statement that Captain Barber was applying for a new commission under a new election, and, he adds, "he starts the same as if he had never been in the service at all." This, Captain Randall says, is a fair construction of the M. C., but the difficulty is that it is not founded on fact. It is not an entering into the service by Captain Barber, for he already holds a commission in the National Guard. His election being to the same rank as that previously held by him, its effect is simply to give him a command. As for rank, that he had by virtue of his former commission in the grade in which he is to exercise command.

The arguments advanced by Captain Randall were considered by me before sending you my opinion on Captain Barber's case. I made no allusion to them at that time, because, as I have already stated, the question was one of law and not of discretion.

There are arguments opposed to Captain Randall's position which are entitled to some weight, but I do not feel called upon to discuss the matter upon the general plan of expediency, inasmuch as it is the duty of those to whom the management of the National Guard is

committed to follow the intent of the Legislature as expressed on the statutes and not to substitute for it some plan which, in their judgment, might be more expedient or more acceptable to the members of the guard.

Captain Randall's protest is mainly based on two erroneous assumptions of fact: First, that Captain Barber, at the time of receiving his last commission, was not an officer of the National Guard; and, second, that the issuing of the new commission conferred upon him a higher rank than he was entitled to at his last election.

I have the honor, therefore, to advise that the protest be overruled, the action objected to having been, in my opinion, upon careful consideration, strictly legal.

I have the honor to remain, very respectfully yours.

WM. M. IVINS,
Brigadier-General and Judge Advocate-General.

STATE OF NEW YORK:

OFFICE OF THE JUDGE ADVOCATE-GENERAL,
STEWART BUILDING, 280 BROADWAY,
NEW YORK, *October* 25, 1887.

Major-General JOSIAH PORTER, *Adjutant-General, N. G. S. N. Y.:*

SIR.—I have the honor to acknowledge the receipt of a communication addressed to you under date of July 23, 1887, by Captain William B. Randall, Forty-first Separate Company, and a communication addressed to you under date of August 31, 1887, by the same officer, and of a letter from the Inspector-General's office addressed to Captain Randall under date of July twentieth.

It appears from the communication dated August thirty-first that Captain Randall, after the termination of his tour of duty at the State camp during the present year, presented separate reports of the number of men in attendance on each separate day of camp duty, which have been returned to him by the Inspector-General's office, calling his attention to R. 373. He states that he so made his returns to the end that he might use four of the camp parades in computing the five compulsory parades called for by M. C. 68, 98. The language of the material portion of M. C. 68 is that "officers other than general and staff officers and enlisted men shall be obliged to perform during the year not less than five compulsory drills and parades, including inspection and muster and camp duty."

The question which, therefore, fairly arises is whether in computing

the five compulsory parades here specified each separate parade during a tour of encampment is to be counted, or whether the expression "camp duty," as here used, includes in it all the parades which may take place during an encampment, and is most accurately represented by the average of attendance at all such parades. This last view is the one which has been adopted in R. 773, which expressly provides that a tour of camp duty shall become only as one parade for the purposes of M. C. 68, 98. I see no reason to doubt the soundness of the construction put by this regulation upon the language quoted from M. C. 68. It seems entirely in accord with the plain and natural meaning of the sentence quoted from M. C. 68. The object which the draughtsman of this sentence seems to have had in view was, first, to require that there should be not less than five compulsory parades by the officers and enlisted men in each year, and, having so expressed himself, he proceeds to designate certain military duty which shall be counted as parades in making up the required number. To this end reference is made to the military service performed at "inspection and muster," and the military service performed at "camp duty."

By reference to M. C. 70 it will be observed that camp duty when performed is to consist of, at least, five consecutive day's service, and, in accordance with military usage and the provisions of M. C. 361, there is required to be a dress parade on each day of such duty. It seems to me that the language of M. C. 68 does not refer to these several parades performed daily, but speaks of them collectively, by the use of the expression "camp duty," words which clearly imply a continuous and varied service, which, under M. C. 70, already referred to, must extend over, at least, five consecutive days. As the expression "camp duty" represents a continuous service extending over several days, it seems eminently proper that the average attendance upon such days should be taken as representing the attendance upon camp duty. It is certainly the most equitable method in view of the construction which, in my opinion, should be placed upon the words quoted.

I have the honor, therefore, to advise that the services rendered during a tour of camp duty, although varied in character and extending over a number of days, can only be counted as one of the five compulsory drills and parades required by M. C. 68.

I have the honor to remain, very respectfully yours.

WILLIAM M. IVINS,
Brigadier-General and Judge Advocate-General.

STATE OF NEW YORK :

OFFICE OF THE JUDGE ADVOCATE-GENERAL,
STEWART BUILDING, 280 BROADWAY,
NEW YORK, *December* 21, 1887.

Major-General JOSIAH PORTER, *Adjutant-General, N. G. S. N. Y.:*

SIR. — I have the honor to acknowledge the receipt of your communication under date of ninth instant, in which you inform me that Col. David E. Austen was elected colonel of the Thirteenth Regiment November 5, 1887, and that the Brigade Commander has forwarded the proceedings of the election with the following remarks, viz.: David E. Austen was formerly colonel of the Thirteenth Regiment and is now on the supernumerary list; that he was commissioned as colonel of the Thirteenth Regiment July 13, 1877; was placed on the supernumerary list December 3, 1883, and has reported as required by law since that time.

From these facts you request my opinion upon the following questions :

First. Should Colonel Austen be assigned to duty as commanding officer of the Thirteenth Regiment, or should a new commission be granted.

Second. Should I decide that a new commission is necessary, should it be with rank as of the date of the recent election or as in the commission which Col. Austen now holds.

Third. Should Col. Austen be required to appear before and examining board.

I will consider these questions in the order in which they are asked.

There is no specific provision in the present M. C. regulating the disposition of cases like the present, and therefore that method of procedure should be adopted which will be in harmony with the general system of practice and government contemplated by this statute. The fifth article of the M. C. is entitled the "election and appointment of commissioned and non-commissioned officers," and contains the various provisions of law to be followed in the choice of such officers. Provision is made for giving notice of the time and place of holding the election, defining who shall vote, the length of time the polls should be kept open, and the manner in which the vote shall be canvassed. (M. C. 32, 33, 34.) It is then required that the person elected, within ten days after notice of his election, signify his acceptance of the office to which he has been elected. Provision is next made for his examination before an examining board, and then comes the thirty-seventh section, which requires that every commissioned officer shall, within ten days after his commission shall be

tendered to him or after notice has been given him that the same is held in readiness for him, take an oath of office, and unless he do so "he shall be deemed to have resigned said office and a new election shall be forthwith ordered to fill his place."

There is no doubt about the method of procedure to be adopted upon the first election of the officer, or where he is elected to a higher rank than that previously held by him. The plain contemplation of the Code is that in all such cases his authority to exercise the command conferred upon him by his election shall be evidenced by a commission. In the army of the United States the commission fixes the rank of its holder in the general service and the particular command over which he is placed is regulated by the order of his superior officer. The plan contemplated by the M. C., is that the members of the guard shall choose those who are to exercise command over them; that this choice shall be made by an election, and the evidence of authority to be issued to the person chosen by an election shall be a commission, this commission carrying with it a certain rank in the general service of the State, and at the same time a right to exercise command over some particular organization in that service. It fulfils the double function of a commission and order in the United States Army. In the present case the applicant holds a certain rank in the service of the State by virtue of his commission, although he is on the supernumerary list. His legal status, as I had the honor to heretofore advise, is that of an officer in commission, but "withdrawn from active service and command." (M. C. 47.) There is a provision in M. C. 44 for the assignment by the Commander-in-Chief of officers on the supernumerary list to active duty, but it is to be observed such assigned officers are not entitled to all the privileges otherwise attached to their rank; notably they are deprived of the right of voting at elections. In the present case the applicant claims the right to command by virtue of an election, not by virtue of an assignment to duty, and I see no reason why the general method of procedure should not be followed in his case by authenticating his right of command by a new commission. This construction is also in accord with the general method of procedure heretofore followed in like cases, and is supported by legislative declarations contained in the Laws of 1869 and 1870, which in terms provide for the issuing of commissions in cases like the present. L. 1869, ch. 778, sec. 10; L. 1870, ch. 80, sec. 70.

The second question was fully investigated and considered by me in my opinion upon the application of Captain Theodore M. Barber, transmitted to you under date of June 20, 1887. I had the honor then to advise that an officer upon the supernumerary list is still in

commission, and, upon an election to command of the same grade as that previously held by him, is entitled to his old date of rank as a matter of right. He has never been out of the service of the State, and has been continuously in commission and in possession of the rank in the military service thereby assured to him. The new commission simply regulates the organization which he is to command.

Referring to the third question, I am of the opinion that the same practice should be pursued in this case as obtains in any other instance of election to military office. It may be argued that the provisions of M. C. 24, requiring officers to be examined as to their moral character and knowledge of military affairs before the issuing of a commission, are directory and not mandatory. Be that as it may, it is very desirable that there should be some fixed and settled rule in all such cases rather than that each case should be disposed of separately. If it is understood that all officers before assuming command are required to pass the statutory examination, there can be no occasion for complaint. On the other hand, if one officer is ordered before such board and another is not, an opportunity is afforded for the claim that such action is derogatory of the dignity of the officer who is compelled to submit to the examination, and that an invidious distinction is made in his case. Such an examination is of very valuable assistance to the Commander-in-Chief and enables him to determine the propriety of issuing a commission and of entrusting any important command to the officer who applies for it. It may be that an officer who has been for a considerable time on the supernumerary list has, by change of habit, or from some other cause, lost those requisites which previously entitled him to the exercise of command. Such a state of affairs can only be satisfactorily brought to light by the action of an examining board. It is therefore, in my opinion, better that the rule should be uniformly followed of having such examinations in cases like the present before entrusting officers with commands at the risk of compelling officers of acknowledged standing to submit to such examinations, than to establish the rule that such examinations are to be wholly omitted, or only had in special instances.

I have the honor, therefore, to advise you

1. That a new commission should be issued to Colonel Austen.

2. That such commission should be with rank as of the date in the commission which Colonel Austen now holds.

3. That before the commission issued he should be required to appear before the statutory examining board.

I have the honor to remain, very respectfully yours.

WM. M. IVINS,

Brigadier-General and Judge Advocate-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *January* 1, 1887.

GENERAL ORDERS, No. 1.

The following changes have occurred during the month of December, 1886, among the commissioned officers of the National Guard, State of New York:

COMMISSIONED.

First Brigade.

Thomas H. Barber, Assistant Adjutant-General, with rank of Lieutenant-Colonel, with rank from November 30, 1886, original.

Clarence H. Eagle, Inspector of Rifle Practice, with rank of Major, with rank from November 30, 1886, original.

Second Brigade.

Fritz Brosé, Aide-de-Camp, with the rank of Captain, with rank from January 26, 1885, original.

Francis D. Beard, Aide-de-Camp, with the rank of Captain, with rank from May 24, 1886, original.

Seventh Regiment.

Daniel A. Nesbitt, First Lieutenant, with rank from November 18, 1886, vice Jones, resigned.

Eighth Regiment.

Alexander T. Mason, Captain, with rank from November 11, 1886, vice Jefferson, resigned.

Henry L. Cammann, First Lieutenant, with rank from November 11, 1886, vice Frazer, resigned.

W. de Lancey Cunningham, First Lieutenant, with rank from November 17, 1886, vice Hussey, resigned.

Haughwout Howe, First Lieutenant, with rank from November 30, 1886, vice Cormier, resigned.

Ike Freeman, Second Lieutenant, with rank from November 11, 1886, vice Baldwin, resigned.

Ninth Regiment.

Charles E. Kohlberger, First Lieutenant, with rank from October 20, 1886, vice Wells, resigned.

Dana B. Pratt, Quartermaster, with the rank of First Lieutenant, with rank from November 19, 1886, vice Gibson, appointed Inspector of Rifle Practice.

Eleventh Regiment.

Arthur E. Schumann, First Lieutenant, with rank from October 25, 1886, vice Herrschaft, resigned.

Twenty-second Regiment.

Nathaniel B. Thurston, Captain, with rank from December 20, 1886, vice Freeman, resigned.

William N. Bavier, Second Lieutenant, with rank from November 22, 1886, vice Charlton, resigned.

Ellsworth R. De Bow, Second Lieutenant, with rank from November 9, 1886, vice O'Neill, promoted.

Walter D. Haws, Second Lieutenant, with rank from December 20, 1886, vice Smith, promoted.

Thirty-second Regiment.

John J. Klein, Captain, with rank from October 29, 1886, vice Bettenhauser, discharged.

Sixty-ninth Regiment.

Patrick J. Morgan, Captain, with rank from October 26, 1886, vice McDonald, resigned.

Seventy-first Regiment.

Charles B. Stone, Second Lieutenant, with rank from November 18, 1886, vice Fisher, resigned.

Seventy-fourth Regiment.

Edmund P. Cottle, Second Lieutenant, with rank from October 19, 1886, vice Wells, resigned.

Third Separate Company.

Benjamin A. Church, Assistant Surgeon, with the rank of First Lieutenant, with rank from May 8, 1886, vice Entler, resigned.

Twenty-third Separate Company.

Henry Waterman, Second Lieutenant, with rank from November 16, 1886, vice Benson, resigned.

RESIGNED.

DATE.	Regiment.	Brigade.	Name.	Office.
1886.				
Dec. 2..	2d Sep. Co.....	4	Frank H. Griswold.....	First Lieutenant.
Dec. 2..	65th Regiment..	4	Allison K. Hume.....	Second Lieutenant.
Dec. 9..	22d Regiment....	1	George P. Freeman.....	Captain.
Dec. 9..	13th Regiment..	2	Lewis M. Reed.....	First Lieut. & Com. of Sub.
Dec. 9..	71st Regiment...	1	William Courtenay	First Lieut. and Quartm'r.
Dec. 9..	71st Regiment...	1	T. Waln Morgan Draper..	Captain.
Dec. 15..	7th Regiment....	1	William C. Casey.....	Captain.
Dec. 20..	11th Regiment...	1	John Paine	Captain.
Dec. 20..	11th Regiment...	1	Gustave Menzel.....	Captain.
Dec. 20..	11th Regiment...	1	Eugene Gallert	Second Lieutenant.
Dec. 28.	32d Regiment....	2	Louis Haas.....	First Lieutenant.

ASSIGNED TO DUTY.

Major Edmund C. Stanton, supernumerary list, as Signal Officer, First Brigade (S. O. No. 94, Series 1886).

DIED.

Captain William H. Courtney, Thirteenth Regiment, December 10, 1886.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *January* 6, 1887.

GENERAL ORDERS, No. 2.

Pursuant to the provisions of M. C. 46, a Board of Examination is ordered to convene at the office of the Inspector-General, Albany, on Monday, January 17, 1887, at 8 o'clock P. M., to examine into the capacity and general fitness for the service of such officers as may be ordered before it.

DETAIL FOR THE BOARD.

Brigadier-General Emile Schaefer, Inspector-General.
Brigadier-General Peter C. Doyle, Fourth Brigade.
Colonel George D. Scott, Eighth Regiment.
Colonel Charles L. Fincke, Twenty-third Regiment.
Major Frederick Kopper, Seventy-first Regiment.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

NOTE.—General Orders No. 31, Series of 1886, is not printed for general distribution. General Orders No. 32 is the last of the Series of 1886.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *February* 1, 1887.

GENERAL ORDERS, No. 3.

The following changes have occurred during the month of January, 1887, among the commissioned officers of the National Guard, State of New York:

COMMISSIONED.

Thirteenth Regiment.

Henry C. Clark, Adjutant, with the rank of First Lieutenant, with rank from June 11, 1885, vice Davis, deceased.

Forty-seventh Regiment.

Eugene E. Bishop, Second Lieutenant, with rank from October 27, 1886, vice McIlvaine, promoted.

RESIGNED.

DATE.	Regiment.	Brigade.	Name.	Office.
1887.				
Jan. 6..	47th Regiment..	2	John H. Cornell.....	First Lieutenant.
Jan. 6..	23d Regiment...	2	James J. Harris.....	Second Lieutenant.
Jan. 6..	41st Sep. Co.....	4	David M. Totman.....	First Lieut. and Asst. Surg.
Jan. 14..	71st Regiment...	1	Samuel G. Blakley.....	Captain.
Jan. 22..	17th Sep. Co.....	2	John Hepburn	First Lieutenant.
Jan. 27..	14th Regiment...	2	Edwin S. Browe.....	Captain and I. R. P.
Jan. 27..	14th Regiment...	2	Claes E. Molin.....	Second Lieutenant.
Jan. 27..	8th Regiment....	1	Stephen Steiniger.....	Second Lieutenant.

DISCHARGED.

Second Lieutenant George A. Crispen, Twenty-sixth Separate Company, upon the recommendation of and for failure to appear before the State Examining Board.—S. O. No. 4, c. s.

ASSIGNED TO DUTY.

Captain G. Henry Witthaus, Supernumerary, at headquarters Ninth Regiment.—S. O. No. 4, c. s.

DIED.

Captain George Gustow, Eighth Regiment, January 22, 1887.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *February* 1, 1887.

GENERAL ORDERS, No. 4.

I. The reports of the Inspector-General, and the observations made by the Adjutant-General, show that as a whole the National Guard of this State has improved during the past year.

No improvement can be permanent, however, unless followed up with continued study and constant practice.

In furtherance of the project to make the guard, in fact as well as in name, a compact, well instructed and reliable body of soldiers, for the preservation of law and order and the protection of the State, it is ordered:

1. That commanding officers of brigades, regiments and battalions, establish schools of instruction for the officers of their respective commands.

2. That commanding officers of batteries and companies establish schools of instructiou for the non-commissioned officers of their respective commands.

3. That the subjects of study be tactics commensurate to the grade of the officers and non-commissioned officers and regulations.

4. That these schools be continued during the drill season; at the close of which, but not later than June fifteenth next, each commanding officer will make a full report to the Adjutant-General, through the channel, of the manner in which this order has been complied with, reporting delinquent or incompetent officers and non-commissioned officers. Intermediate commanding officers will not only examine these reports carefully and express their opinion freely, but will see that the schools are held and that proper instruction is imparted.

5. The Inspector-General will make special report of every officer found at the next annual inspection incompetent to perform, or ignorant of his duties.

II. In order that the troops to be ordered to the State camp this season may derive the fullest benefit of their tour of duty, officers and enlisted men are reminded that, as has been frequently stated before, the camp has been established for instruction only; that anything calculated to interfere with this object cannot be tolerated, and that discipline and decorum must at all times be observed; and it is ordered:

1. That the military exercises to be executed and practiced in camp, shall consist of such tactical movements as cannot be carried out in

armories, of the skirmish drill, and of schools of theoretical instruction for officers and non-commissioned officers.

2. That no men shall be taken to camp who are not already sufficiently well drilled to take part in those exercises, nor any men (those re-enlisted or taken up from dropped, excepted,) who have been enlisted within sixty days of the beginning of the camp tour of their respective companies.

3. Theoretical instruction in guard duty should be imparted to non-commissioned officers and privates by their respective company commanders, before entering the camp. Instruction as to the general routine and duties of soldiers in camp should also be imparted in the same manner.

4. The Paymaster-General is directed not to pay any officer or enlisted man for services, if such cover only the day of arrival, the Sunday following, the day of leaving, or only one day, in camp.

III. There being no rifle practice in camp, and it being of the utmost importance, in view of the perfection of fire arms, that the personal improvement of the soldier in marksmanship should be developed as much as time and circumstance will permit; it is ordered:

1. That organizations which do not go into camp, shall, during the season devote as much time as possible to out-door rifle practice.

2. That during the season when out-door rifle practice is undesirable, sufficient time shall be devoted to theoretical instruction, sighting and aiming, and, where possible, to gallery practice.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *February* 4, 1887.

General Orders, No. 5.

I. The following instructions, prepared by the General Inspector of Rifle Practice, are published for the guidance of the National Guard:

To obtain uniformity, insure steadiness, and accustom the men to the aiming position, the following is prescribed as an exercise for that purpose:

SIGHTING DRILL.

1. A sandbag for each squad (one twelve pound or two six pound bags), will be placed on a rest, which may be a table, a tripod, or a stack of arms, placed so that the bag will be about four and one-half feet from the ground.

The men will be formed in single rank, and in squads not to exceed ten men in each.

The instructor will then flatten the sandbag with the back of his hand, and lay a rifle on it, aim at some small object at as great a distance from it as the drill-room will permit (a wafer on the wall, for instance), and explain to the men the following simple rules:

The sights shall not incline to the right or left.

The line of sight should be taken along the centre of the notch of the back sight and the top of the fore sight, which should cover the middle of the mark aimed at.

The eye should be *fixed on the mark*, and not on the fore sight. Particular attention should be paid to this rule, as beginners are apt to fix the eye on the fore sight, and not the mark, which prevents the latter from being distinctly seen, and greatly increases the difficulty in aiming.

2. The instructor will also explain the different kinds of sights, viz.:

Fine sight. When the point of the forward sight is just seen through the notch of the breech sight, the effect of which is to shoot low.

Full sight. When the whole of the wedge-shaped portion of the front sight is displayed through the notch on the breech sight, the effect of which is to shoot high.

Half sight. When but half the fore sight is seen.

As soon as these rules and explanations are thoroughly understood, the instructor will proceed to the

AIMING DRILL.

Which will invariably be drilled by the numbers, as follows:

(One.) Execute the first motion of load.

(Two.) Raise the rifle smartly in front of the right shoulder to the full extent of the left arm, without moving the body, head, or eye; the arms to move close to the body, the breech sight to be upright, barrel nearly horizontal and pointing a few inches below the mark; the eyes are fixed upon the forefinger inside the trigger-guard, both elbows inclined downward.

(Three.) Press the piece smartly with both hands against the hollow of the shoulder, which must neither be allowed to give way nor pressed forward or raised to meet it; the left elbow at the same time being brought as far under the rifle as is possible without assuming an unnatural position, the right elbow slightly raised, being nearly square with the right shoulder. The center (or rather the upper than lower) part of the butt to be pressed firmly against the shoulder with the

left hand without touching the collar-bone, the top of the butt being as nearly as possible with the top of the shoulder. The forefinger will be placed around the trigger like a hook, but without pressing it. The head and body will be kept perfectly perpendicular the whole time, no attempt being made to look through the sights.

(Four.) Close the *left* eye, incline the head to the right over the small of the stock so that the right eye may quickly perceive the coincidence of the rear and front sights, and the object aimed at.

(Five.) Raise the head, look squarely to the front and bring the piece smartly to the first position.

The drill is continued by the commands two; three; four; five; and when the instructor wishes to suspend the exercise, he will command: 1. Carry; 2. Arms.

The aiming drill will be continued until the men aim quickly and correctly from the shoulder.

II. Brigade commanders will issue the necessary orders to insure the thorough instruction of the infantry portion of their respective commands, before the commencement of the field practice, in the sighting and aiming drills, and also, where such be practicable, in gallery practice.

Not less than four drills, each of at least thirty minutes duration, should be had in these exercises in each company before May first, next.

Regimental and Battalion Inspectors of Rifle Practice should attend at least one of these drills ; the Inspectors of Rifle Practice of Brigades at least two of the drills in each regiment and battalion of their respective brigades ; and the Inspector of Rifle Practice of the Third Brigade should also attend at least one of such drills in the Sixth, Seventh, Twelfth, Sixteenth, Twenty-third, Thirty-second, Thirty-sixth and Thirty-seventh, and such other separate companies of the brigade as may be found practicable.

Inspectors of Rifle Practice, and the commanding officers of separate companies not visited by the former, will also be instructed to make a report of these drills to the General Inspector of Rifle Practice on or before the tenth of May, next.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK :

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *February* 5, 1887.

GENERAL ORDERS, No. 6.

The collection of official decisions on tactics and other points, issued in pamphlet form, is herewith promulgated for the information and government of those concerned.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK :

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *March* 1, 1887.

GENERAL ORDERS, No. 7.

I. The following changes have occurred during the month of February, 1887, among the commissioned officers of the National Guard, State of New York:

COMMISSIONED.

Seventh Regiment.

James Thorne Harper, Captain, with rank from January 13, 1887, vice Casey, resigned.

Thirteenth Regiment.

David F. Lucas, Assistant Surgeon, with the rank of Captain, with rank from December 29, 1886, vice Mathewson, resigned.

Lewis M. Reed, Commissary of Subsistence, with the rank of First Lieutenant, with rank from December 29, 1886, vice Reed, resigned.

Charles W. Topping, Quartermaster, with the rank of First Lieutenant, with rank from December 29, 1886, vice Werner, resigned.

Van D. Macumber, Second Lieutenant, with rank from November 26, 1886, vice Spier, transferred.

Fourteenth Regiment.

Alfred E. Steers, First Lieutenant, with rank from November 15, 1885, vice Campbell, appointed Adjutant.

Twenty-second Regiment.

John Lamb, Second Lieutenant, with rank from December 27, 1886, vice Weed, resigned.

Twenty-third Regiment.

Arthur C. Saunders, First Lieutenant, with rank from January 17, 1887, vice Aldridge, promoted.

David K. Case, Second Lieutenant, with rank from January 17, 1887, vice Harris, resigned.

Seventy-first Regiment.

Abel W. Belknap, Captain, with rank from January 21, 1887, vice Draper, resigned.

Edward C. O'Brien, First Lieutenant, with rank from December 7, 1886, vice Taylor, resigned.

Charles E. Brown, Quartermaster, with the rank of First Lieutenant, with rank from January 4, 1887, vice Courtenay, resigned.

Emile R. Bangs, Second Lieutenant, with rank from November 22, 1886, vice Place, promoted.

Forty-first Separate Company.

Harry C. Baum, Assistant Surgeon, with the rank of First Lieutenant, with rank from January 12, 1887, vice Totman, resigned.

RESIGNED.

DATE.	Regiment.	Brigade.	Name.	Office.
1887.				
Feb. 1..	65th Regiment..	4	George A. Williams.....	Captain.
Feb. 1..	29th Sep. Co.....	4	Louis N. Post.....	First Lieutenant.
Feb. 1..	41st Sep. Co.....	4	George B. Wood.....	First Lieutenant.
Feb. 1..	35th Sep. Co.....	3	William L. Best.....	Captain.
Feb. 2..	13th Sep. Co.....	4	Conrad A. Hult.....	Captain.
Feb. 3..	47th Regiment...	2	Edward J. Clarry	Second Lieutenant.
Feb. 10..	.....	..	Henry A. Allen.....	Major Supernumerary.
Feb. 10..	71st Regiment...	1	Robert A. Sewell.....	First Lieutenant.
Feb. 11..	23d Regiment....	2	Franklin P. Swazey.....	First Lieutenant.
Feb. 16..	71st Regiment...	1	Thomas A. McBain.....	Captain.
Feb. 16..	71st Regiment...	1	James Addison Wight....	Second Lieutenant.
Feb. 16..	13th Regiment...	2	Charles L. Spier	Second Lieutenant.
Feb. 17..	71st Regiment...	1	Appleton D. Palmer.....	Lieutenant-Colonel.
Feb. 17..	7th Regiment....	1	Edward E. Sage.....	Second Lieutenant.
Feb. 17..	8th Regiment....	1	John McCauley.....	Second Lieutenant.
Feb. 18..	65th Regiment...	4	Frederick E. Fowler.....	First Lieutenant.

DISCHARGED.

First Lieutenant William H. Gornee, Twenty-sixth Separate Company, upon the recommendation of and for failure to appear before the State Examining Board, S. O. No. 7, c. s.

DIED.

First Lieutenant Louis A. Blenderman, Quartermaster, Thirty-second Regiment, January 27, 1887.

II. The following organizations have been disbanded:
Fourth Battery, Third Brigade, S. O. No. 12, c. s,
Twenty-fourth Separate Company, Third Brigade, S. O. No. 16, c. s.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *March* 21, 1887.

GENERAL ORDERS
No. 8.

I. Commanding officers of brigades, regiments and battalions, will forward direct to the General Inspector of Rifle Practice, No. 8 Coenties Slip, New York city, on or before April 15, 1887, a list containing the full name, rank and position of each member of their respective staffs on April 1, 1887.

II. Commanding officers of companies of regiments, of separate companies and of such batteries as may be armed with the rifle, will also forward in same manner, lists of their commands containing full name and rank of each member.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *March* 31, 1887.

GENERAL ORDERS,
No. 9.

Permission to enter and pass through the State of New York, armed and equipped, is hereby granted all military organizations in the United States desiring to attend the national drill and encampment to be held at the city of Washington, D. C., from the twenty-third to the thirtieth of May, 1887.

By order of the Commander-in-Chief.

JOSIAH PORTER.
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK :

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *April* 1, 1887.

GENERAL ORDERS, No. 10.

I. The following changes have occurred during the month of March, 1887, among the commissioned officers of the National Guard, State of New York :

COMMISSIONED.

Judge-Advocate General's Department.

William W. Ladd, Jr., Assistant Judge-Advocate General, with the rank of Lieutenant-Colonel, with rank from February 25, 1887 original.

Third Battery.

Crawford D. Beasley, Assistant Surgeon, with rank of First Lieutenant, with rank from January 3, 1887, vice Merritt, resigned.

Seventh Regiment.

Horace C. Du Val, First Lieutenant, with rank from February 10, 1887, vice Harper, promoted.

George H. Gould, Second Lieutenant, with rank from March 1, 1887, vice Sage, resigned.

Eighth Regiment.

Maunsell Van Rensselaer, Jr., Captain, with rank from February 18, 1877, vice Chauncey, promoted.

George C. Heilner, Second Lieutenant, with rank from February 5, 1887, vice Steiniger, resigned.

Eleventh Regiment.

Harold Christensen, First Lieutenant, with rank from January 17, 1887, vice Adolph, resigned.

Louis L. Coudert, Second Lieutenant, with rank from January 17, 1887, vice Gallert, resigned.

Jarvis W. Mason, Second Lieutenant, with rank from January 21, 1887, vice Lyon, promoted.

Walter L. Miller, Second Lieutenant, with rank from January 26, 1887, vice Hochman, promoted.

Twelfth Regiment.

John Macaulay, Captain, with rank from December 31, 1886, vice Eagle, resigned.

Fourteenth Regiment.

J. Freeman Atwood, Surgeon, with the rank of Major, with rank from January 3, 1887, vice Fowler, promoted.

Sixty-fifth Regiment.

William H. Hicks, Jr., First Lieutenant, with rank from February 7, 1887, vice Hazel, resigned.

Elmer E. Seaman, First Lieutenant, with rank from February 21, 1887, vice De Laney, resigned.

Edward S. De Forest, Second Lieutenant, with rank from February 7, 1887, vice Hume, resigned.

Sixty-ninth Regiment.

John J. Scanlon, Second Lieutenant, with rank from December 28, 1886, vice Carroll, promoted.

Seventy-first Regiment.

Frederick Kopper, Lieutenant-Colonel, with rank from February 26, 1887, vice Palmer, resigned.

James E. Place, Captain, with rank from February 15, 1887, vice Blakley, resigned.

Philip S. Tilden, First Lieutenant, with rank from March 10, 1887, vice Harris, transferred.

William T. Gouch, Second Lieutenant, with rank from March 1, 1887, vice Lake, resigned.

Clinton H. Smith, Second Lieutenant, with rank from March 10, 1887, vice Wright, resigned.

Second Separate Company.

Henry S. Dunning, First Lieutenant, with rank from December 28, 1886, vice Griswold, resigned.

Third Separate Company.

Burr Mattice, First Lieutenant, with rank from February 17, 1887, vice Scott, promoted.

Tenth Separate Company.

William J. Whited, First Lieutenant, with rank from January 17, 1887, vice Odell, resigned.

Eighteenth Separate Company.

Fred. B. Streeter, Assistant Surgeon, with the rank of First Lieutenant, with rank from January 7, 1887, vice Moorehead, resigned.

Twenty-fourth Separate Company.

Charles B. Wood, Captain, with rank from March 17, 1887, original.

Ames E. McIntyre, First Lieutenant, with rank from March 17, 1887, original.

Lewis Stivers, Second Lieutenant, with rank from March 17, 1887, original.

Thirty-third Separate Company.

William B. Morrow, Assistant Surgeon, with the rank of First Lieutenant, with rank from September 10, 1886, original.

Thirty-fourth Separate Company.

Frederick A. Mallette, Second Lieutenant, with rank from February 3, 1887, vice Siglar, resigned.

Thirty-fifth Separate Company.

Henry Holland, Captain, with rank from February 8, 1887, vice Best, resigned.

Thirty-eighth Separate Company.

De Solvo H. Tifft, First Lieutenant, with rank from July 12, 1886, vice Stearns, promoted.

Forty-third Separate Company.

Culver Gilman Thyng, Captain, with rank from March 17, 1887, original.

Henry Fred Lee, First Lieutenant, with rank from March 17, 1887, original.

Wilbur H. Carringer, Second Lieutenant, with rank from March 17 1887, original.

RESIGNED.

DATE.	Regiment.	Brigade.	Name.	Office.
1887.				
Mar. 3..	9th Regiment ...	1	Daniel A. Skinnell.....	Second Lieutenant.
Mar. 3..	13th Sep. Co.....	4	Gustaf F. Smith.....	Second Lieutenant.
Mar. 3..	40th Sep. Co.....	4	Rhesa Griffin	Captain.
Mar. 8..	14th Regiment ..	2	Alfred W. Redfern.....	First Lieutenant.
Mar. 8..	47th Regiment ..	2	Leander V. Roberts	Captain.
Mar. 8..	47th Regiment ..	2	Charles F. Hicks.....	Second Lieutenant.
Mar. 24..	30th Sep. Co.....	4	Robert J. Knox.....	Second Lieutenant.
Mar. 31..	14th Regiment...	2	William J. Clark.....	Second Lieutenant.

DISCHARGED.

Colonel Thomas S. Wand, Sixth-fifth Regiment, upon the recommendation of and for failure to appear before the State Examining Board. (S. O. No. 17, c. s.)

First Lieutenant Roland de V. Parker, Eleventh Regiment, upon the recommendation of the State Examining Board. (S. O. No. 17, c. s.)

Second Lieutenant William N. Toshach, Third Battery, upon the recommendation of the State Examining Board. (S. O. No. 17, c. s.)

DIED.

Captain Henry Ward Beecher, Chaplain, Thirteenth Regiment, March 8, 1887.

Captain David Moffatt, Jr., Twenty-third Regiment, March 31, 1887.

II. The following companies have been organized:

In the Third Brigade.

Twenty-fourth Separate Company, at Middletown. Special Orders No. 23, dated March 17, 1887. Mustered into service March 28, 1887,

In the Fourth Brigade.

Forty-third Separate Company, at Olean. Special Orders No. 24, dated March 17, 1877. Mustered into service March 29, 1887.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *April* 14, 1887.

GENERAL ORDERS, No. 11.

Private Theodore Woods, Fourteenth Regiment, N. G., S. N. Y., was tried on February 8, 1887, before a court-martial convened by S. O. No. 82, series of 1886, from these headquarters, and of which Colonel Harry W. Michell of the Fourteenth Regiment, N. G., was president, on two charges: Drunkenness on duty, and disrespect to his superiors.

The first charge was based on a specification which alleged that while under orders on the 19th day of June, 1886, he was so under the influence of alcoholic spirits as to be unable to perform his duties, and such disability and intoxication was shown on Myrtle avenue and Fulton street, in the city of Brooklyn, and on board the steamship "Henry E. Bishop," while said Regiment was proceeding from its armory to the Camp of Instruction at Peekskill, N. Y.

The specification under the second charge alleged that in a loud and boisterous manner he called the captain and lieutenant of his company vulgar names, and in a boisterous manner threatened to do such officers bodily harm, all of which took place while he was on duty

and proceeding with his regiment from its armory to the State Camp of Instruction, on June 19, 1886.

The accused appeared before the court in person and by counsel, and pleaded guilty to the charges and specifications, and the court found him guilty on such charges and specifications, and sentenced him to be dishonorably discharged with loss of time served.

The proceedings, findings and sentence of the court-martial in the foregoing case have been approved by the Commander-in-Chief, and the sentence will be duly executed.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *April* 15, 1887.

GENERAL ORDERS, No. 12.

I. The annual inspection and muster of the organizations named below, will take place as follows:

Thirty-first Separate Company, Mohawk, Tuesday, May 10, 2.30 P. M.

Twenty-eighth Separate Company, Utica, Wednesday, May 11, 2.30 P. M.

Fortieth Separate Company, Syracuse, Thursday, May 12, 3 P. M.

Fifth Battery, Syracuse, Thursday, May 12, 8 P. M.

Twenty-ninth Separate Company, Oswego, Friday, May 13, 3 P. M.

Ninth Separate Company, Whitehall, Tuesday, May 17, 2 P. M.

Eighteenth Separate Company, Glens Falls, Wednesday, May 18, 3 P. M.

Twenty-second Separate Company, Saratoga Springs, Thursday, May 19, 3 P. M.

Thirty-sixth Separate Company, Schenectady, Friday, May 20, 2 P. M.

Thirty-seventh Separate Company, Schenectady, Friday, May 20, 2 P. M.

Thirteenth Separate Company, Jamestown, Tuesday, May 24, 10 A. M.

Seventy-fourth Regiment, Buffalo, Wednesday, May 25, 8 P. M.

Sixty-fifth Regiment, Buffalo, Thursday, May 26, 8 P. M.

Forty-second Separate Company, Niagara Falls, Friday, May 27, 2.30 P. M.

First Separate Company, Penn Yan, Tuesday, May 31, 3 P. M.

Twenty-sixth Separate Company, Elmira, Wednesday, June 1, 3 P. M.
Thirtieth Separate Company, Elmira, Thursday, June 2, 2 P. M.

II. Commanding officers will parade their respective commands in heavy marching order; cartridge boxes will be worn in front; overcoats rolled on knapsacks; forage cap in the knapsack, and, with the exception of the Fifth Battery, will parade on grounds suitable for field manœuvres.

III. Commanding officers will prepare their muster rolls and forward the same promptly to the Inspector-General at Albany, as required by R. 593 (sixth clause), and the attention of all officers is directed to section 5, paragraph I, of General Orders No. 4, c. s.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *April* 15, 1887.

GENERAL ORDERS, No. 13.

I. Rifle practice will be required the current season of every officer and enlisted man (excepting officers and men of batteries not armed with rifles, and musicians), at times and places to be designated in orders by Brigade Commanders.

II. When a command has had an opportunity for a first general practice, the Brigade Commander may, upon the application of its immediate commanding officer appoint a subsequent day, or days, for voluntary practice. Commanding officers may excuse members of their respective commands from the first general practice, provided they attend a regularly ordered voluntary practice.

III. The actual cost of transportation, but in no case to exceed fifty cents, will be allowed for every officer and enlisted man attending the first general practice of his organization, provided that the distance to its nearest available range is more than three miles. Additional practice must be free of expense to the State.

IV. The present allowance of ammunition for practice is limited to forty rounds for each officer, non-commissioned officer and private, carried on the returns for the quarter ending March 31, 1887.

V. Requisitions for transportation and ammunition will be made direct on the Chief of Ordnance, State Arsenal, corner Seventh Avenue and Thirty-fifth street, New York city.

VI. Scores made, in any class, at a regular rifle association match, in which the full military conditions, including uniform, are observed, and which is approved by the General Inspector of Rifle Practice, will be recognized as official. Such practice, will not, however, excuse absence from first general practice as ordered.

VII. Record books of field practice must be kept written up in ink. Alterations in score cards must be certified to by an Inspector of Rifle Practice. After each practice the score cards will be compared under the supervision of the senior Inspector of Rifle Practice present; the left half will be forwarded by such officer to the General Inspector of Rifle Practice within five days after the practice, the other half will be retained by the commanding officer of the organization practicing.

VIII. The State prize will be competed for at Creedmoor as usual. The brigade prizes will be competed for under such conditions as shall be ordered by the commanding officers of brigades. A prize of a value not to exceed $50 will be awarded the company in each brigade having the highest general figure of merit. Attention is called to R. 372, the last clause of which applies to the successful teams of 1885 and 1886.

IX. The first general practice should be completed before August 1, but *must* be completed before September fifteenth next. Practice for the season will close November twelfth next, and no scores made after that date will be recognized. Field practice books, fully written up, must be sent to the General Inspector of Rifle Practice, No. 8 Coenties Slip, New York city, on or before November 20, 1887.

X. The classification, order of duty and general instructions, prepared by the General Inspector of Rifle Practice, are herewith published for the guidance and observance of all concerned.

CLASSIFICATION.

The third class shall consist of all who do not appear on a range for practice.

The second class consists of all present for practice, without reference to qualifications in previous years, and the practice in this class will be at 100 yards standing, on a third class or No. 3 target, and at 200 yards kneeling, or sitting, on a third class or No. 3 target.

The first class consists of those who score twenty-five and upward in the second class, and the practice in this class will be at 200 yards standing, No. 3 target, and at 500 yards lying prone, No. 2 target.

A score of twenty-five and upward in the first class constitutes a marksman, and entitles the maker to receive the State decoration.

A score of forty-two and upward in the first class constitutes a sharp-shooter, and entitles the maker to receive a silver bar.

All officers and enlisted men who practice, must shoot through the regular classes, and are prohibited from shooting for a second or higher score in a class in which they have already qualified. The record must stand upon the first qualifying score made. But should any marksman without expense to the State, on other than a practice day, and under proper supervision make a score qualifying as a sharp-shooter, he will be credited with such score.

No score by officer or enlisted man will be recognized, unless made at a target to which he has been regularly assigned, and where his name has been previously entered on a score blank.

FIRST GENERAL PRACTICE.

(*a.*) The practice will commence with class firing in squads, under a competent non-commissioned officer, or other duly designated instructor, at each firing point, and the whole under the supervision of an Inspector of Rifle Practice, subject to the orders of the commanding officer present.

Five consecutive shots will be fired at each distance.

This practice will be continued to the end by all present without reference to the scores recorded, except that those who fail to qualify in the second class may be restricted to two shots for practice at each of the higher ranges.

The practice at 500 yards may be postponed until after the course of firing in ranks.

In regular class practice no officer or enlisted man will be permitted to fire more than five consecutive shots at any one distance on the same day, except the necessary sighting shots to ascertain elevation, windage and the condition of pieces, which may be fired by officers or well-instructed men, under the inspection or approval of an Inspector of Rifle Practice. Trial practice between classes will not be permitted.

At the first distance of either class (*i. e.* at 100 or 200 yards) a score of *twelve* or upward is considered as qualifying, and *second* practice may be allowed to such men as fail to qualify at either distance (as above), provided time will permit; but *third* practice shall not be allowed in any case. If, however, the entire tour of duty, including volley and skirmish firing, has been performed, and time still permits, such practice may be had as the Inspector of Rifle Practice deems proper.

Those who may be qualified at 200 and 500 yards, but not at 100 and 200, may make their scores valid by practicing through the second class without shooting in the first again.

In regular practice each enlisted man will shoot with the piece issued by the State, and brought by him on the grounds, unless the same is declared imperfect by an Inspector of Rifle Practice. In that case the man may shoot with the nearest approved piece in the ranks.

(*b.*) *Volley Firing, Five Rounds.*—Firing in ranks at 100 yards shall then be taken up in the following order, the squad or company being formed in a single rank:

Fire by squad (or company), three rounds.

Fire by squad (or company), kneeling, two rounds.

(*c.*) *Firing as Skirmishers.*—The troops shall be exercised as skirmishers from 325 to 100 yards and return; firing, on the advance, one round at 300 yards, one at 200 yards, and one at 100 yards; and on the retreat, one round at 150 yards, and one at 250 yards; great care being taken by each commanding officer that the men are deliberate and cautious, that no accident may happen. Officers should use discretion and tact, varying the drill according to their ground and targets, deploying men and taking such distances as targets and range will allow; each body of troops to be so divided that no more may be exercised at one time than can be readily be handled on the range, a second class target being used.

As soon as the last (fifth) shot is fired, assemble on the right (or left), thus leaving the front uncovered, so that the second squad or company may deploy; during this time the marking can be done.

Commanding officers are particularly cautioned to use great care in handling their men, having the element of safety in view at all times.

SECOND OR VOLUNTARY GENERAL PRACTICE:

Those present will practice in the classes to which they respectively belong. In other respects the tour of duty will be identical with that prescribed for first general practice, including volley firing and firing as skirmishers.

GENERAL INSTRUCTIONS.

Officers.—A sufficient number of commissioned officers must accompany all parties for rifle practice to command and instruct the men. At least one company officer will be present with any part of his company on duty, and a field officer will take command of all the detachments of two or more companies.

In practice officers shall shoot first, then non-commissioned officers, then privates, on such targets as may be assigned to their companies.

The responsibility of officers on the range is great. Good officers will be theoretically proficient in the use of the rifle and able to apply armory instruction in the field. The men will be instructed as much as possible while waiting their turns to shoot, and especially in aiming and position drill, for which a competent instructor should be detailed in each company. They should be taught how to blacken their sights and how to fix the correct elevation and windage before going to the firing points.

Surgeons.—Commanding officers shall in all cases detail a surgeon to accompany any party ordered out for rifle practice, and the duty should not proceed without the presence of a competent medical officer, provided the organization has one attached to it.

Inspection of Practice.—Brigade Inspectors of Rifle Practice will inspect the practice for the marksman's decoration (except in authorized matches), and Brigade or Regimental Inspectors the class shooting in their respective organizations and certify to the score cards.

Organizations having no Inspector of Rifle Practice will be inspected by the Brigade Inspector, or an officer detailed for that purpose.

An inspector who is not able to be personally present on any occasion of duty will so report to his commanding officer, who will then detail a competent officer to act in his stead.

Brigade Commanders will on issuing any order relating to rifle practice, cause a copy to be sent to the General Inspector of Rifle Practice.

Wooden Targets for volleys, and (where needed) for skirmish firing, should be erected without expense to the State on each range. A simple fence painted to represent the necessary lines or divisions, or a frame covered with paper or muslin printed, if backed by a mound sufficient for safety, will suffice. Iron targets, second class, may be used for skirmish drill, but must not be used for volley firing.

Front Sight Covers of such pattern as may be easily detached will be allowed in practice for the marksman's badge—but they must not be permanently attached to the rifle.

Particular Attention is called to the fact that the 300 yard range was eliminated from class practice in 1886, and that five shots kneeling or sitting at 200 yards was substituted for it; also that the volley firing will be performed in single rank.

XI. To encourage practice with the rifle and to enable members of the National Guard to become proficient in its use, members in uniform, coat or blouse, cap and belt, of the First and Second Brigades, may practice (under such supervision and with such competent instruction as the General Inspector of Rifle Practice may direct), on

the second, third, fourth, fifth, sixth, seventh, ninth, tenth, eleventh, twelfth, thirteenth and fourteenth of May next, on which dates the range at Creedmoor will be open and scorers and markers furnished. Cards for the certification of membership will be furnished each organization, and upon presentation of these at the depots of the L. I. R. R. Co. to a person who will be stationed there previous to the trains leaving for Queens (about 8.30 A. M. and 2 P. M.), transportation will be furnished, and on arrival at Creedmoor ammunition will be provided. All scores will be kept, and to any member who in the judgment of the General Inspector of Rifle Practice shows sufficient proficiency a certificate will be given, which will relieve him from practice in the second class with his organization.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *April* 16, 1887.

GENERAL ORDERS, No. 14.

I. To accomplish the full purpose and intent for which boards of examination are appointed, and to secure uniformity in the action of such boards, the following is ordered and promulgated for the information and observance of all concerned:

1. Commanding officers of brigades are authorized to appoint, for their respective commands, the board of examination prescribed in M. C. 24, and they shall announce in general orders the appointment and composition of such board.

2. Upon receipt of the return of election, or appointment of an officer, the respective brigade commander shall order the officer elected or appointed to appear before the examining board of the brigade, furnish him at the same time with blank form No. 37 *b*, and direct him to fill out this form and to present it to the board on his appearance before it. The return of election, or appointment, shall then be referred to the board of examination, with information, added on form 37, of the date set for the appearance of the candidate.

3. Boards of examination shall meet immediately after appointment and arrange their method of procedure, subject to the provisions of this order. Not less than three members shall be present at the examination of a candidate. Not more than six persons should be

examined at any one session of the board, and on the application of a candidate, the board may postpone his examination once, for not more than one month, if the reasons adduced appear satisfactory.

4. The candidate shall be required to present form 37 *b*, properly executed by himself, and to sign it in the presence of the board; he shall then be examined as to his place of birth and age (M. C. 24); date and place and manner of admission to citizenship, if not a native citizen of the United States (M. C. 24); whether or not he has been adversely reported upon by any military examining board (M. C. 24), dishonorably discharged, dismissed or cashiered from any military service whatsoever, or convicted of felony (R. 157). This shall be succeeded by examination as to qualification in the cases of chaplains (M. C. 10); of medical officers (M. C. 23); of judge-advocate (R. 154); of inspectors of rifle practice (R. 155); of engineers (R. 156); and of colonels of the line (M. C. 27). Then follows examination into his moral character (M. C. 24); honesty and sobriety (R. 608, 609), and physical qualifications for service (R. 610); if there be no medical officer on the board, the latter may require the candidate to be examined by a medical officer of the National Guard, if it be deemed advisable. The board may call for evidence (M. C. 24, R. 609), on any one or all of these points. Should the result of the inquiry be unsatisfactory on any one of these points, the examination shall at once be discontinued and the ascertained fact, or facts be reported, on form 37 *b*, to the brigade commander.

5. The examination of a candidate as to his knowledge of English grammar, reading and writing, geography, arithmetic, history, military code and regulations, sedentary duties and tactics of his arm of service (M. C. 24, R. 611-613) may be divided among the members of the board to expedite matters. The examination is to be oral, except where the nature of the subject requires it to be in writing. The questions asked should not become stereotyped, and must never be put in print. On each of the subjects named there shall be placed a possible maximum of one hundred, and no candidate shall be reported favorably who does not obtain in this examination an average of seventy-five per cent at least; unless he be appointed or elected from civil life, in which case the board may report him favorably even if below that average, if his intelligence, knowledge and interest in military matters make it appear that he will make a good officer. On form 37 the board will state "reports *favorably* 75 *per cent*" (or more), or "*unfavorably* 74 *per cent*" (or less), or "*favorably, from civil life, it is believed he will make a good officer*," or something to this effect.

6. The examination concluded, the board will at once report on the return of election, or appointment, (form 37), to the brigade com-

mander. Any candidate inquiring for its finding, or his standing, will be referred by the board or its members to that officer.

7. The board having reported favorably, the brigade commander will forward the return of election, or appointment, (form 37), and the completed statement (form 37 *b*), to the Adjutant-General. If the candidate shall have been adjudged unqualified, the brigade commander will give notice of such adverse decision and issue the necessary directions to have another person elected or appointed (M. C. 24), except where the candidate has been found not to be a citizen of the United States, or not to be of the legal age, in which cases the papers shall be referred to this office for the action of the Commander-in-Chief.

II. The examination of non-commissioned officers (M. C. 28) shall be conducted as nearly as practicable on the system outlined for examination of officers, except that form 37 *b* will not be used, the candidate shall be ordered to appear before the board by the commanding officer of the regiment, battalion, battery or separate company, and the officers authorized to appoint these boards (M. C. 28) shall announce the appointment in orders.

III. A military body cannot reach the proficiency it owes to itself, or the efficiency it owes to the State, without competent officers, commissioned and non-commissioned; that the boards of examination should perform their duties solely with the interests of the service before them, is therefore so apparent and necessary, that further directions on this subject seem not to be required.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *April* 16, 1887.

GENERAL ORDERS, No. 15.

I. Major J. Frederick Ackerman, Thirteenth Regiment, N. G., S. N. Y., was tried before a court-martial convened pursuant to S. O. No. 92, Series of 1886, from these headquarters, and of which Lieutenant-Colonel Heman Dowd, Twelfth Regiment, was president, upon a charge of conduct to the prejudice of good order and military discipline, founded on six specifications. The first and second specifications charged the use of certain improper language concerning the colonel of his regiment. The third specification charged that he "did

say to and advise First Lieutenant Henry C. Clark, Thirteenth Regiment, then Acting Adjutant, that he, the said First Lieutenant Henry C. Clark should not accept any office or position upon the staff of said regiment, if the same should be tendered to him by Colonel Edward Fackner, Thirteenth Regiment, because it was a question of a short time only whether Colonel Fackner would be forced out of the regiment or the regiment disbanded. This at the armory of said Thirteenth Regiment, in the city of Brooklyn aforesaid, on or about the 14th day of October, 1886."

The fourth specification charged that he had endeavored to persuade junior officers of the regiment to join him in the opposition to his regimental commander, and falsely represented that his opposition and conduct had the approval of certain general officers.

The fifth specification charged that he did combine with other officers of his regiment to oppose the authority of the colonel, and in furtherance of such combination, took part in a meeting of such officers at which plans and means to compel the retirement of the colonel were discussed.

The sixth specification charged him with knowledge of certain insubordinate demonstrations of enlisted men, and with encouraging and failing to quell the same.

The court found Major Ackerman, on the first, second, fourth, fifth and sixth specifications, not guilty; on the third specification, guilty in that he "did say to and advise First Lieutenant Henry C. Clark, Thirteenth Regiment, then Acting Adjutant, that he, the said First Lieutenant Henry C. Clark, should not accept any office or position upon the staff of said regiment if the same should be tendered to him by Colonel Edward Fackner, Thirteenth Regiment," and not guilty as to the remainder of such specification, and not guilty of the charge, and acquitted him of the same.

II. The Commander-in-Chief has approved the findings of the court on the first, second, fourth, fifth and sixth specifications. The finding on the third specification is approved so far as it finds Major Ackerman guilty, and disapproved so far as it finds him not guilty; and the finding of not guilty on the charge is disproved, for the reason that the entire third specification is proved by the evidence, the testimony of the witness for the prosecution not being met, but being supported by the testimony of Major Ackerman.

III. It is shown by the record that an election was held in September, 1886, to fill the office of Colonel of the Thirteenth Regiment. From the testimony of Major Ackerman, it appears that this contest gave rise to some warmth of feeling, and that considerable discontent and dissatisfaction continued amongst the members of the regiment

after the election was completed. In the contest between the candidates for this position, Major Ackerman, according to his own statement, took "an earnest and leading part" in opposition to the successful officer.

Every officer has a right to interest himself in any such election, and to vote for that candidate whom he deems best qualified to discharge the duties of the position to be filled. But when the election is ended and the result of the ballot is made known in form of law, it becomes his duty to lay aside any feeling of opposition he may previously have entertained against a candidate, and yield to his superior officer most loyal assistance in carrying into execution his plans for the welfare of the regiment, and for the maintenance of order and discipline. It becomes his duty also to promptly repress and discourage any feeling of discontent or dissatisfaction which may have arisen from the warmth of the contest or from any other cause. In the present case, the action of Major Ackerman, as charged in the third specification, tended directly to keep alive any existing feeling of dissatisfaction against his superior officer, and was to the prejudice of good order and discipline.

It is so important that any feeling of opposition against a candidate for office in the guard should promptly cease with the announcement of his choice by election, and the existence of such feeling is so sure to evidence itself by overt acts and lead to laxity of discipline, and, ultimately, to destroy the usefulness of the organization in which the same is permitted, that the Commander-in-Chief in the present case has felt himself called upon to formally disapprove of the action of the court in this case, in order that it may not be taken as a precedent in the future.

The Commander-in-Chief is sensible of the respect which is due to the judgment of a court-martial, and of the consideration to which Major Ackerman is entitled in view of his military record and previous service to the State. He is, however, impressed with the consideration that the responsibility of maintaining the discipline and order of the National Guard rests, not upon the officers composing any court, but upon those to whom the command of the guard is by law committed. To the proper discharge of this duty, every consideration of delicacy towards individual officers and public tribunals must be subordinated.

IV. The court-martial before which this case was tried is dissolved, and Major Ackerman will be released from arrest.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *April* 18, 1887.

GENERAL ORDERS, No. 16.

I. Second Lieutenant William K. Smith, Thirteenth Regiment, N. G., S. N. Y., was tried before a general court-martial, convened by S. O. No. 82, series of 1886, from these headquarters, and of which Colonel Harry W. Michell, Fourteenth Regiment, N. G., was president, upon the following charges and specifications:

Charge 1. Conduct unbecoming an officer and a gentleman.

Specification one alleged that when duly ordered to report to his Regimental Commander, and, on or about September 10, 1886, he did, in the presence and hearing of several enlisted men, use certain vulgar and disrespectful language.

Specification two alleged that when ordered to report to his Regimental Commander as aforesaid, he did, in the presence and hearing of several enlisted men, inquire of one or more of them whether he should obey such order.

Specification three alleged the use, on or about September 10, 1886, of certain vulgar and disrespectful language concerning First Lieutenant Henry C. Clark, of the Thirteenth Regiment.

Specification four set forth that on or about September 14, 1886, he countenanced, approved and incited the enlisted men of his company to insubordination, and especially by affixing his signature to a paper requesting the resignation of his company commander.

The second charge was conduct to the prejudice of good order and military discipline.

Specification one alleged that on or about September 10, 1886, upon being remonstrated with by his Regimental Commander against inciting the enlisted men of the Thirteenth Regiment, or a portion thereof, to acts of insubordination, he did state to such commanding officer that he was inciting men to acts of insubordination, and would not endeavor to discourage such acts, and was doing all he could to incite the enlisted men of his company against their captain.

Specification two charged that upon being ordered by his Regimental Commander, on or about September 10, 1886, to refrain from inciting the enlisted men of Company H against their captain, he replied that he would continue to incite such men to insubordination until they got rid of their captain.

There were two supplemental charges: The first, disobedience of orders, with a specification that on October 11, 1886, upon being ordered by his colonel to go to the quarters of his company he failed and refused to obey such order.

The second charge was unmilitary and unofficer-like conduct, with two specifications.

Specification one alleged that, having been placed in arrest and assigned limits by his colonel, he broke his arrest and went beyond such limits, and this on October 11, 1886.

Specification two alleged that on October 6, 1886, having been placed in arrest, he did, in the presence and hearing of several enlisted men, request his company commander to resign his office.

The Commander-in-Chief has approved the proceedings, findings and sentence of the court, except the finding of guilty on the second and fourth specifications of the first charge, which have been disapproved for the reason that neither the specifications nor the evidence given thereunder sustain in law the charge; and with the further exception of the finding of guilty upon supplemental charge one and the specification thereunder, and upon specification two of supplemental charge two, which findings are disapproved for the reason that the evidence adduced does not sustain such charge and findings as a matter of law.

The court found Lieutenant Smith guilty on all the charges and specifications, and its sentence, as approved and modified, by remitting a part of the punishment, is that he be cashiered.

II. By the evidence in this case it appears that the commanding officer of the Thirteenth Regiment, having been informed that Lieutenant Smith was inciting insubordinate conduct, sent for him and asked whether the report was correct. According to the finding of the court, Lieutenant Smith admitted he was inciting opposition to the captain of his company, and against the remonstrance and strict orders of the colonel commanding he avowed his intention to continue his conduct till his company commander was forced from his position. Instead of heeding this timely admonition, it is found by the court that Lieutenant Smith, at a subsequent date, and when under arrest awaiting trial on the serious charges above set forth, took part with other members of his company in a secret caucus plainly called for the purpose of determining what action, looking towards the captain's removal from command, could be taken with safety to those concerned. He approved of the action of that caucus and was present and acquiesced in the public presentation to his company commander of the request for his resignation.

The argument that Lieutenant Smith's conduct was dictated by considerations of what the best interest of his company required cannot avail. It is not left to every member of the guard to pass on the propriety of his superior officer's conduct, to determine his

unworthiness to continue in the service, and to force him from command if he deems that result desirable. There are legal and orderly methods provided for the determination of such matters, and when a soldier departs from them he does so on his own responsibility. The conduct of Lieutenant Smith in this matter appears to have been partly, if not wholly, due to the action of his superior officer in voting at the then recent election for colonel of the regiment. The present case is another instance of the grave results to which such feelings, if not promptly put aside, may lead, and to which the Commander-in-Chief has recently directed attention in general orders.

The language which Lieutenant Smith used when ordered to attend his colonel and when speaking of a brother officer was most unbecoming, unjustifiable and inexcusable.

In reviewing the proceedings of the court, the Commander-in-Chief has been called upon to disapprove of the finding of guilty on one charge and on several specifications, and he has seen fit, in the exercise of his clemency, to remit a part of the punishment called for by the sentence. The penalty of a dishonorable dismissal from the service is itself a most severe one, and will mark the full disapprobation of the Commander-in-Chief of the conduct of which Lieutenant Smith has been found guilty.

III. The sentence of the court, so far as it directs that Lieutenant Smith be cashiered, will be carried into execution.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *May* 2, 1887.

GENERAL ORDERS, No. 17.

I. The following changes have occurred during the month of April, 1887, among the commissioned officers of the National Guard, State of New York:

COMMISSIONED.

Fourth Brigade.

Alan H. G. Hardwicke, Inspector of Rifle Practice, with the rank of Major, with rank from June 3, 1884, vice Bell, resigned.

Frederick A. Jewett, Ordnance Officer, with the rank of Major, with

rank from March 15, 1887, vice Hardwicke, appointed Inspector of Rifle Practice.

Charles R. Wilson, Aid-de-Camp, with the rank of Captain, with rank from March 15, 1887, vice Jewett, promoted.

Eighth Regiment.

Haughwout Howe, Captain, with rank from March 5, 1887, vice Gustow, deceased.

George P. Cammann, Second Lieutenant, with rank from March 5, 1887, vice Cunningham, promoted.

Ninth Regiment.

Harry A. Ely, Second Lieutenant, with rank from December 23, 1886, vice Remsen, resigned.

Twelfth Regiment.

James W. Gerard, Jr., First Lieutenant, with rank from March 10, 1887, vice Macaulay, promoted.

Charles M. Jesup, Second Lieutenant, with rank from March 24, 1887, original.

Thirteenth Regiment.

J. Frank Dillont, Captain, with rank from February 4, 1887, vice Courtney, deceased.

Twenty-third Regiment.

Edward J. Kraft, Second Lieutenant, with rank from March 7, 1887, vice Saunders, promoted.

Sixty-fifth Regiment.

George J. Haffa, Captain, with rank from March 22, 1887, vice Williams, resigned.

Walter F. Nurzey, First Lieutenant, with rank from March 10, 1887, vice Fowler, resigned.

Seventy-first Regiment.

Maurice D. Guiry, First Lieutenant, with rank from March 2, 1887, vice Serrell, resigned.

Seventy-fourth Regiment.

Benjamin L. Love, First Lieutenant, with rank from March 9, 1887, vice Dance, promoted.

Henry L. Fish, Jr., Second Lieutenant, with rank from March 9, 1887, vice Dent, promoted.

Eighth Separate Company.

Frederick W. G. Bailey, Second Lieutenant, with rank from March 2, 1887, vice Hess, promoted.

Twenty-ninth Separate Company.

William Monaghan, First Lieutenant, with rank from February 23, 1887, vice Post, resigned.

Forty-first Separate Company.

Mark J. Blakely, First Lieutenant, with rank from February 8, 1887, vice Wood, resigned.

RESIGNED.

DATE.	Regiment.	Brigade.	Name.	Office.
1887.				
Apr. 1..	65th Regiment..	4	Frank H. Carr.....	First Lieutenant.
Apr. 1..	14th Sep. Co	3	George M. Brink.....	First Lieutenant.
Apr. 6..	69th Regiment..	1	Robert McFeeley	First Lieutenant.
Apr. 6..	69th Regiment..	1	Patrick J. Goggin.....	Second Lieutenant.
Apr. 6..	69th Regiment..	1	Patrick McMorrow	Second Lieutenant.
Apr. 6..	47th Regiment..	2	Emile F. Christoffel	Second Lieutenant.
Apr. 13..	14th Regiment..	2	Thomas M. Harvey.....	Second Lieutenant.
Apr. 14..	65th Regiment..	4	Walter C. Mason.....	Captain.
Apr. 14..	65th Regiment..	4	Robert A. Decker	First Lieutenant.
Apr. 21..	32d Regiment...	2	Charles Vorgang	Captian and I. R. P.
Apr. 21..	.....	4	Harlow C. Palmer	Major and Inspector.
Apr. 21..	7th Regiment...	1	Bradish J. Smith.....	Second Lieutenant.
Apr. 27..	15th Sep. Co.....	3	Charles Brittain	Second Lieutenant.

DISCHARGED.

First Lieutenant Edwin W. Burrage, Twelfth Separate Company, pursuant to section forty-three, Military Code (S. O. No. 33, c. s.)

DIED.

Captain James G. Wallace, Inspector of Rifle Practice, Sixty-ninth Regiment, April 14, 1887.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *May* 4, 1887.

GENERAL ORDERS, No. 18.

I. First Lieutenant Russell Benedict, Thirteenth Regiment, N. G., was tried before the general court-martial convened pursuant to S. O. No. 82, series of 1886, from these headquarters, and of which Colonel Harry W. Michell, Fourteenth Regiment, was president, upon

two charges. The first charge being unmilitary and unofficerlike conduct accompanied by four specifications. The first specification charged that he "did write and send and cause to be delivered to his superior officer, Lieutenant-Colonel Edward Fackner, Thirteenth Regiment Infantry, N. G., S. N. Y., who had previously put in arrest Second Lieutenant William K. Smith, Thirteenth Regiment, N. G., S. N. Y., pending his trial upon charges, a writing in the following words: 'Unless Smith instantly released, you will force me to retaliate. Such contemptible tactics to smother opposition can't succeed.'"

The second specification alleges that having been placed in arrest and assigned limits by his colonel, he did break said arrest and go beyond said limits.

The third specification charged that he did "in the presence and hearing of several enlisted men of said Thirteenth Regiment, request his superior officer and company commander, Captain Charles P. Kretschmar, to resign his said office."

The fourth specification set forth that he did incite, countenance and assist several of the enlisted men of this company to acts of insubordination and breaches of discipline against their commander, and especially to request him to resign his office.

The second charge was disobedience of orders accompanied by three specifications.

The first charged that having been ordered to meet his colonel at the armory he did fail and refuse to obey said order. The second specification alleged that upon being ordered by his colonel to state whether or not he had written or sent to him a certain telegram, he refused to obey such order.

The third specification set forth that upon being ordered by his colonel to go to the quarters of the company he did fail and refuse to to obey said order.

The court found the accused guilty of the first chargd and of all the specifications thereunder, and guilty on the second charge and on the first and third specifications thereunder, and not guilty on the second specification, and imposed a sentence which, as approved and modified, directs that the accused be cashiered.

II. The Commander-in-Chief has approved the finding of guilty on the first and third specifications of the first charge and on the first charge. He has disapproved the finding of guilty on the second specification of the first charge and on the third specification of the second charge for the reason that such specifications and the evidence thereunder do not in law sustain such respective charges. The finding of guilty on the fourth specification of the first charge is disap-

proved for the reason that the same is not supported by evidence. The finding of guilty on the first specification of the second charge is disapproved for the reason that the specification is not sufficiently proved. The finding of not guilty on the second specification of the second charge is disapproved as the specification is bad in law. The finding of guilty on the second charge is disapproved, being unsupported by any approved finding.

III. In reviewing the sentence imposed by the court, and modifying it only to the extent stated, the Commander-in-Chief has considered not only the fact that the original sentence is only sustained by two approved findings of guilty on the first charge "unmilitary and unofficerlike conduct" — but he has also considered the position taken by Lieutenant Benedict at the trial that, although his discharge was, according to his testimony, withheld over a year prior to his trial to enable him to perform military service, which he did thereafter from time to time perform until his arrest, yet when called on to justify his military acts during this time, he claims not to have been bound by any commission, and to have been free from all responsibility therefor.

Upon an examination of the records at these headquarters it is found that the facts are not accurately presented in this record. Lieutenant Benedict's resignation was received at these headquarters on May 27, 1885, and a full discharge issued to him under date of May 29, 1885. In the succeeding month the commanding officer of the Thirteenth Regiment was, at his urgent request, granted permission to withhold service of the discharge. Subsequently, and under date of September 18, 1885, Lieutenant Benedict applied for leave to withdraw his resignation, writing that "the discharge required by law was not furnished to me, and I have not ceased to be a member of the National Guard." Upon this the acceptance of the resignation was formally revoked by S. O. No. 91, series of 1885, and the certificate of discharge is on file so endorsed.

The Commander-in-Chief makes no further comment on these facts than to point out that they dispose of the objection raised to the court's jurisdiction, and that Lieutenant Benedict's status in view of the granting of his application in September, 1885, and his subsequent service ought not to have been a matter of any doubt to him at the time of his trial.

The action of the Commander-in-Chief, in disapproving of the finding of guilty on the first specification of the second charge, is solely due to the failure to legally prove the offense charged, and must not

be taken as an approval of the conduct of Lieutenant Benedict, whose attitude toward his superior officer in this matter is strongly condemned.

IV. The court-martial before which this case was tried is hereby dissolved, and the sentence of cashiering will be executed.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK :

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *May* 12, 1887.

GENERAL ORDERS, No. 19.

I. The annual inspection and muster of the organizations named below will take place as follows :

Seventh Separate Company, Cohoes, Thursday, June 9, 2 P. M.

Twelfth Separate Company, Troy, Friday, June 10, 2.30 P. M.

Twenty-first Separate Company, Troy, Monday, June 13, 2.30 P. M.

Sixth Separate Company, Troy, Tuesday, June 14, 2.30 P. M.

Thirty-second Separate Company, Hoosick Falls, Wednesday, June 15, 3 P. M.

Twenty-third Separate Company, Hudson, Thursday, June 16, 3.30 P. M.

Sixteenth Separate Company, Catskill, Friday, June 17, 2.30. P. M.

Fourteenth Separate Company, Kingston, Monday, June 20, 3 P. M.

Tenth Separate Company, Newburgh, Tuesday, June 21, 2.30 P. M.

Fourth Separate Company, Yonkers, Wednesday, June 22, 3 P. M.

Fifteenth Separate Company, Poughkeepsie, Thursday, June 23, 2.30 P. M.

II. Commanding officers will parade their respective commands in heavy marching order on grounds suitable for field manœuvres ; cartridge-boxes will be worn in front ; overcoats rolled on knapsacks and forage cap in the knapsack.

III. Commanding officers will prepare their muster rolls and forward the same promptly to the Inspector-General at Albany, as required by R. 593 (6th clause), and the attention of all officers is directed to section 5, par. I, of General Orders No. 4, c. s.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *May* 16, 1887.

GENERAL ORDERS, No. 20.

I. For the government of the Camp of Instruction, when occupied by troops, the following general regulations are ordered and promulgated for the guidance of all concerned:

1. The camp is constituted a military post, and will be conducted in accordance with the rules provided for the government of military posts and these regulations.

The post commander will prescribe in orders the hours and calls of service and the duties to be performed, subject to section 1 of paragraph II of General Orders No. 4, c. s., but no reviews will be authorized except by orders from this office.

He will prescribe the amount of camp and garrison equipage and blank ammunition to be issued to the troops in camp.

2. The chief of ordnance, as such, and as acting quartermaster-general and acting commissary-general of subsistence, will cause the Camp of Instruction to be prepared in time for its occupancy by troops. He will provide and keep on hand at the camp the necessary quartermaster and ordnance stores, and after consultation with the surgeon-general, the necessary medical stores and supplies; he will provide, by contract, for the furnishing of cooked meals to the troops in camp, and will see that the meals are properly and promptly furnished, well cooked, of wholesome quality and sufficient quantity; he will furnish the necessary transportation to officers and enlisted men ordered there to and from the camp; and he will exercise in camp a general supervision of all public property not by law and regulations in the care of others, the mess arrangements and the public buildings and grounds.

Transportation for troops to the camp will be furnished, as far as practicable, in such manner that they will arrive at the camp not later than 3 o'clock, P. M., of the day ordered.

3. The surgeon-general is charged with the general supervision and direction of the medical service at the camp, and is authorized to select one competent person, who shall have charge, under his direction, of the medical stores at the camp, and who shall receive for his services transportation, rations and the pay allowed by law to hospital stewards.

4. The paymaster-general is charged with the payment of the troops on the last day of their tour in camp, and will take the necessary measures to pay each person entitled thereto, in accordance with

sections 2 and 4 of paragraph II of General Orders No. 4, c. s., from these headquarters, by a check drawn to his, the person's, order.

5. Commanding officers of regiments, battalions, batteries and separate companies, and officers specially detailed, if not traveling with troops, will at once, upon notice of detail for camp service, make requisition for proper transportation of men and baggage from their station to the Camp of Instructtion, direct, on the acting quartermaster-general, the chief of ordnance, State arsenal, Thirty-fifth street and Seventh avenue, New York city. Commanding officers will specify the exact number of men, as nearly as possible, for whom transportation is required, and transportation will not be allowed for men who, under sections 2 and 4 of paragraph II of General Orders No. 4, c. s., from these headquarters, will not be entitled to pay. On arrival in camp, or as soon thereafter as practicable, commanding officers of troops arriving by railway transportation will settle their transportation accounts with the acting quartermaster-general, the chief of ordnance. Transportation will be allowed for one servant for the officers of each company and the field and staff of a battalion, and for three servants for the field and staff of a regiment.

Horses for field officers will be furnished by the post quartermaster, and transportation or forage will not be allowed for any other horses.

On the journey to and from, and the march into camp, the senior officer will command the troops present, and before leaving their stations commanding officers will telegraph to the post commander the strength of their command, servants separately.

6. Surgeons of regiments and assistant surgeons of separate companies detailed for camp service, if traveling with troops, will each make timely requisition through their immediate commanding officers for a hospital knapsack, with medical stores and instruments, upon the acting quartermaster-general, the chief of ordnance, to whom they will return such knapsack immediately upon the arrival of their regiments or companies at their regular stations.

7. Upon arrival in camp, commanding officers of regiments, battalions and detachments, and officers specially detailed, will at once report for instructions to the post commander, and regimental and battalion commanders will at the same time submit requisitions for the necessary quartermaster stores for the approval of the post commander.

8. Commanding officers of regiments and battalions will direct their respective senior medical officer to report, on arrival in camp, for orders and instructions to the surgeon-general. The senior medi-

cal officer in camp will perform the duties of post surgeon, and within ten days after his return from camp will, on form 72, prepare and forward a report of his tour of service, through his regimental commander, to the surgeon-general.

The hospital steward of the regiment in camp, or if there be none, a suitable person selected by the surgeon-general, will act as post hospital steward, under the orders of the post surgeon, and the instructions of the surgeon-general. Such person, or hospital steward, must have passed an examination before the State Board of Pharmacy, and be licensed as a druggist, according to the laws of the State; and regimental and battalion hospital stewards not so examined and licensed, will not be recognized by the State, or permitted to act as hospital stewards. Regimental and battalion commanders ordered to camp duty, whose hospital stewards do not meet these requirements, will at once report the fact to these headquarters.

9. Regimental and battalion commanders, on arrival in camp will direct their commissaries of subsistence to report for duty while in camp, to the acting commissary-general of subsistence, the chief of ordnance, without being, however, relieved from duty with their regiments or battalions.

A ration will consist of early bread and coffee, breakfast, dinner and supper. Ration returns will be prepared by the company commanders each day immediately after retreat or dress parade, covering all the rations received by their respective commands during the day; as a basis for the return of the day will be taken the number of officers and men present at breakfast, allowing one day's ration for each; to this will be added the number of meals received by men joining subsequent to breakfast. Adjutants will perform the duties of a company commander for the field, staff, non-commissioned staff and band.

Company returns will be consolidated the same evening by regimental and battalion commanders, who will deliver the consolidation to the post commander; at the close of the tour these officers will deliver to the post commander, a consolidated return, in duplicate, of all the rations received, which will be the voucher upon which the chief of ordnance will pay the contractors.

Commanding officers of troops coming from distant stations, should see that their commands are properly provisioned for the journey.

Rations will be allowed for the authorized number of servants.

10. The pay rolls, in triplicate, will be prepared *before* going into camp by entering on them the name of each officer and enlisted man of the organization, *with the date of rank of officers and date of enlistment of the enlisted men.* In camp credit will be given for the day, after

retreat of such day, excepting the last two days, and the rolls fully completed, signed and amounts carried out, will be handed to the paymaster-general as early before the close of the tour as possible, to enable him to pay the troops before their departure from camp. If practicable, the pay rolls should be signed, by the officers and enlisted men, before coming in camp, but they must be signed on the first Sunday in camp.

Pay will be allowed to officers and enlisted men present for the days on which the regiment or company arrives at, and departs from, the camp; and for such other days of the tour during which they are present, at least for guard mounting in the morning until after retreat or dress parade in the evening, provided their whole stay in camp does not consist simply in coming to camp on Saturday and spending Sunday there, or staying but one day, and returning on Friday to depart again on Saturday. (See, also, sections 2 and 4 of par. II, General Orders No. 4, c. s.)

11. Commanding officers of regiments, battalions and companies are, and will be held, responsible for the correctness of returns and reports rendered by them.

There should be a well-instructed clerk to relieve the first sergeants of, or to assist them in, the clerical duty. In each company, the first sergeant, or the clerk, should keep a list for each day on which to place the name of every man arriving or leaving, and the hours of his arrival or departure, during the day; this list will be found of great value to them in making the ration return, crediting the pay after retreat, and preparing the report book next morning.

The report book must show the condition of the company *at the time the report is made,* and the remarks are to explain all the alterations which may have occurred since making the last report.

Within ten days after the close of the camp tour, commanding officers of regiments and battalions will make reports to the Adjutant-General of the general management of their command and the results obtained.

12. The State service uniform will be worn as prescribed in the regulations; on drill, fatigue, and when not on actual duty, the fatigue coat, R. 835, may be worn. White helmets may be worn by regiments and battalions fully supplied with them.

13. The officers detailed as commanding officers of battalions are authorized, each, to select two competent officers of suitable rank, and five non-commissioned officers, to serve with them at the camp of instruction respectively as adjutant, quartermaster and commissary of subsistence, sergeant major, quartermaster sergeant, color bearer provost sergeant and clerk.

The names of officers and non-commissioned officers thus selected will as soon as possible be reported to the Adjutant-General.

14. The following books and blanks furnished by the State are required in camp:

By regimental and battalion commanders, forms 8, 12, 56, 69, 70.

By surgeons, forms 13, 71, 71.

By company commanders, forms 9, 56, 69.

And the attention of all officers is especially called to R. 134, 135, 170, 179, 180, 376, 387, 412, 473, 475, 477, 478, 479, 773.

15. Persons not connected with the administration of the post, or not being members of the organizations in camp, will not be permitted in the camp after tattoo.

16. The sale of all spirituous liquors, wine, ale, or beer, and all huckster and auction sales within one mile of the camp are prohibited.

No ale, beer, wine or spirituous liquors shall be used in camp, except upon the prescription of the post surgeon.

Fire works, illuminations, and other out-of-place performances will not be permitted.

II. The following organizations are detailed for tours of service at the Camp of Instruction:

The Seventh Regiment from June 18 to June 25, 1887.

The Twelfth Regiment from June 25 to July 2, 1887.

The Ninth Regiment from July 2 to July 9, 1887.

The Forty-seventh Regiment from July 9 to July 16, 1887.

The Twenth-third Regiment from July 16 to July 23, 1887.

The Seventy-first Regiment from July 23 to July 30, 1887.

The Twenty-second Regiment from July 30 to August 6, 1887.

The Tenth Battalion from July 23 to July 30, 1887.

The Fifth Separate Company from July 9 to July 16, 1887.

The Sixth Separate Company from July 2 to July 9, 1887.

The Eleventh Separate Company from July 2 to July 9, 1887.

The Seventeenth Separate Company from June 25 to July 2, 1887.

The Nineteenth Separate Company from July 9 to July 16, 1887.

The Twentieth Separate Company from July 9 to July 16, 1887.

The Thirty-fifth Separate Company from June 25 to July 2, 1887.

The Thirty-eighth Separate Company from July 2 to July 9, 1887.

The Forty-first Separate Company from July 2 to July 9, 1887.

The Sixth Battery, as infantry, from July 9 to July 16, 1887.

The Sixth, Eleventh, Thirty-eighth and Forty-first Separate Companies will form a provisional battalion, the first.

The Fifth, Nineteenth and Twentieth Separate Companies and the Sixth Battery will form a provisional battalion, the second.

The Seventeenth and Thirty-fifth Separate Companies will be considered, during their tour of camp duty, as part of the Twelfth Regiment, Colonel James H. Jones, armory, Ninth avenue, Sixty-first and Sixty-second streets, New York city.

The commanding officer of the Sixth Battery, and those of the separate companies, ordered in camp, will report at once, by mail, to the officers assigned to the command of the battalion, or the commanding officer of the regiment, of which they are to form part, furnishing the names and dates of rank of their officers and non-commissioned officers, and such other information as may be desired by those officers.

Assistant Surgeons of separate companies not detailed by name for duty at the Camp of Instruction, are excused from such duty.

III. The following officers are assigned to duty at the State camp:

As Post Commander, Major General Josiah Porter, Adjutant-General, with such officer or officers as he may select, as assistants.

As Quartermaster, Commissiary of Subsistence, and Ordnance Officer, the Chief of Ordnance, assisted by such officer or officers as he may select.

As Post Adjutant, Col. Fred. Phisterer, A. A. A. Gen'l.

As commanding officers of provisional battalions: Of the 1st, Major Frank A. Jones, Eleventh Regiment, New York city; of the 2d, Major Geo. A. Miller, Twenty-second Regiment, New York city.

As Medical Officer of the First Provisional Battalion, Assistant Surgeon Clarkson C. Schuyler, Sixth Separate Company.

As Medical Officer of the Second Provisional Battalion, Assistant Surgeon John P. Wilson, Nineteenth Separate Company.

IV. Regimental bands will be furnished with transportation and rations, and five hundred dollars will be paid for the services of a band during the tour of its regiment, by the Paymaster-General, on the pay-roll of the field and staff, to the commanding officer of each regiment.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK :

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *June* 1, 1887.

GENERAL ORDERS, No. 21.

The following changes have occurred during the month of May, 1887, among the commissioned officers of the National Guard, State of New York :

COMMISSIONED.

Fourth Brigade.

Nathaniel Rochester, Inspector, with the rank of Major, with rank from April 26, 1887, vice Palmer, resigned.

Seventh Regiment.

James B. Dewson, First Lieutenant, with rank from May 10, 1887, vice Haight, resigned.

Wallace F. Peck, Second Lieutenant, with rank from April 26, 1887, vice Smith, resigned.

Ninth Regiment.

James M. Maconnell, Second Lieutenant, with rank from April 18, 1887, vice Skinnell, resigned.

Eleventh Regiment.

George W. Mooney, Captain, with rank from April 14, 1887, vice Paine, resigned.

Twenty-third Regiment.

Charles F. Guyon, Captain, with rank from May 12, 1887, vice Moffat, deceased.

William P. Pickett, First Lieutenant, with rank from May 2, 1887, vice Swazey, resigned.

Thomas M. Close, Second Lieutenant, with rank from May 11, 1887, vice Pickett, promoted.

Thirty-second Regiment.

Van D. Macumber, Inspector of Rifle Practice, with the rank of Captain, with rank from April 25, 1887, vice Vorgang, resigned.

Jacob R. Teel, Quartermaster, with the rank of First Lieutenant, with rank from April 8, 1887, vice Blenderman, deceased.

Robert H. McKittrick, Second Lieutenant, with rank from April 15, 1887, vice Wagenhauser, resigned.

Forty-seventh Regiment.

Hewlings H. Quick, Captain, with rank from April 12, 1887, vice Roberts, resigned.

R. George Williams, First Lieutenant, with rank from April 1, 1887, vice Cornell, resigned.

A. Polhemus Cobb, Second Lieutenant, with rank from April 1, 1887, vice Hicks, resigned.

Seventy-first Regiment.

Wallace A. Downs, Major, with rank from April 19, 1887, vice Kopper, promoted.

John A. H. Dressel, Captain, with rank from March 30, 1887, vice McBain, resigned.

William Brooke, First Lieutenant, with rank from April 8, 1887, vice McFarlan, resigned.

Seventy-fourth Regiment.

Samuel Byron Newton, Second Lieutenant, with rank from March 24, 1887, vice Ralston, transferred.

Tenth Separate Company.

Thomas T. Haviland, Second Lieutenant, with rank from April 4, 1887, vice Whited, promoted.

Fourteenth Separate Company.

John G. Van Etten, First Lieutenant, with rank from April 14, 1887, vice Brink, resigned.

Seventeenth Separate Company.

Frank N. Bell, First Lieutenant, with rank from March 1, 1887, vice Hepburn, resigned.

RESIGNED.

DATE.	Regiment.	Brigade.	Name.	Office.
1887.				
May 5..	7th Regiment ...	1	Moreau Morris.....	Capt. and Ass't Surgeon.
May 5..	7th Regiment ...	1	E. Graham Haight.....	First Lieutenant.
May 11..	23d Regiment ...	2	Charles L. Fincke.....	Colonel.
May 11..	11th Regiment ..	1	Arthur E. Schuman.....	First Lieutenant.
May 11..	30th Sep. Co	4	Benjamin F. Prall	First Lieutenant.
May 11..	.....	....	S. Douglas Cornell.....	Colonel, Supernumerary.
May 11..	32d Regiment....	2	William Strining	Captain.
May 11..	47th Regiment...	2	Thos. W. McCormack	Second Lieutenant.
May 20..	9th Regiment ...	1	James A. Mulligan.....	Captain.
May 20..	26th Sep. Co.....	4	Myron S. Watkins	First Lieut. & Ass't Surg.
May 24..	7th Regiment ...	1	James E. Ware.....	Second Lieutenant.
May 25..	.....	....	Lloyd S. Bryce.....	Brig. Gen. & Pay M. Gen'l.
May 26..	9th Sep. Co.....	3	James H. Parke.....	Captain.
May 26..	9th Sep. Co.....	3	Rufus R. Davis.....	First Lieutenant.

DISCHARGED.

First Lieutenant William Goebel, Thirty-second Regiment, pursuant to M. C. 43. (Special Orders No. 44, s. c.)

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *July* 13, 1887.

GENERAL ORDERS, No. 22.

The attention of commanding officers of regiments, battalions, batteries and separate companies is called to the clauses of R. 592 and 593, which require the commanding officers of regiments and battalions to forward to the Inspector-General direct "report of attendance within ten days" and those of batteries and separate companies "within five days, after a tour of camp duty, after the annual inspection, and after each regimental or battalion drill or parade" or "after each drill or parade ordered in accordance with subdivisions 1 and 2 paragraph 365, of these regulations;" and to the final clause of R. 773 which is as follows: "Organizations failing to render return of attendance as prescribed by paragraph 592 and paragraph 593, * * * , at the time they are due, * * * , cannot receive the State allowance for that year.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *July* 23, 1887.

GENERAL ORDERS, No. 23.

The following changes have occurred during the month of June, 1887, among the commissioned officers of the National Guard, State of New York:

COMMISSIONED.

Subsistence Department.

Joseph P. Jardine, Assistant in, with the rank of Captain, with rank from May 25, 1887. Original.

Seventh Regiment.

William A. Valentine, Assistant Surgeon, with the rank of Captain, with rank from June 1, 1887, vice Morris, resigned.

John McGreevey, Second Lieutenant, with rank from May 25, 1887, vice Dewsen, promoted.

Stephen W. Merritt, Second Lieutenant, with rank from May 26, 1887, vice Ware, resigned.

Twelfth Regiment.

J. Langdon Erving, Second Lieutenant, with rank from May 12, 1887, vice Gerard, promoted.

Arthur E. Schuman, Second Lieutenant, with rank from May 24, 1887, vice Wing, resigned.

Twenty-second Regiment.

John A. Quigley, First Lieutenant, with rank from May 4, 1887, vice Thurston, promoted.

James P. Kenworthy, First Lieutenant, with rank from May 6, 1887, vice Preece, promoted.

Thirty-second Regiment.

John J. Elzenbeck, First Lieutenant, with rank from February 23, 1887, vice Haas, resigned.

Forty-seventh Regiment.

John B. Christoffel, Jr., Captain, with rank from May 6, 1887, vice Davenport, resigned.

John W. Barlow, First Lieutenant, with rank from May 17, 1887, vice Schaefer, promoted.

Sixty-fifth Regiment.

John B. Rawson, Jr., Second Lieutenant, with rank from April 5, 1887, vice Seaman, promoted.

Sixty-ninth Regiment.

John J. Ryan, Inspector of Rifle Practice, with the rank of Captain, with rank from May 2, 1887, vice Wallace, deceased.

Robert E. Ford, Commissary of Subsistence, with the rank of First Lieutenant, with rank from May 1, 1887, vice Ryan, promoted.

John McCauley, First Lieutenant, with rank from May 17, 1887, vice McFeeley, resigned.

Seventy-first Regiment.

Clarence M. Davis, Second Lieutenant, with rank from May 17, 1887, vice Guiry, promoted.

Henry Deike, Second Lieutenant, with rank from May 27, 1887, vice Dressel, promoted.

James H. Southworth, Second Lieutenant, with rank from June 1, 1887, vice Gillie, resigned.

Second Separate Company.

Clarence James Barber, Second Lieutenant, with rank from May 3, 1887, vice Dunning, promoted.

Thirteenth Separate Company.

Henry Smith, Captain, with rank from May 31, 1887, vice Hult, resigned.

John Cadwell, Second Lieutenant, with rank from May 31, 1887, vice Smith, resigned.

Thirty-fifth Separate Company.

Lawrence M. Proctor, First Lieutenant, with rank from April 19, 1887, vice Holland, promoted.

John W. Benton, Assistant Surgeon, with the rank of First Lieutenant, with rank from April 28, 1887. Original.

Fortieth Separate Company.

Theodore M. Barber, Captain, with rank from October 16, 1877, vice Griffin, resigned.

RESIGNED.

DATE.	Regiment.	Brigade.	Name.	Office.
1887.				
June 10..	12th Regiment..	1	Richard Deeves.....	First Lieut. & Com. of Sub.
June 10..	23d Regiment...	2	J. De Witt Clark	First Lieutenant.
June 15..	23d Regiment...	2	Edwin A. Lewis.....	Major and Surgeon.
June 17..	74th Regiment..	4	George S. Ralston	Second Lieutenant.
June 24..	74th Regiment..	4	Wm. H. Bradish	First Lieutenant.
June 24..	65th Regiment..	4	Fred E. Tanner	Second Lieutenant.
June 30..	47th Regiment..	2	John M. Ranken	Captain.
June 30..	23d Regiment...	2	Francis P. Harron	First Lieutenant.
June 30..	71st Regiment...	1	Edwin A. McAlpin	Colonel.

DISCHARGED.

Captain Howard F. Kennedy, Ninth Regiment, pursuant to M. C. 43. (Special Orders No. 49, c. s.)

RELIEVED.

Colonel William J. Denslow, as Inspector, Second Brigade. Returned to supernumerary list. (Special Orders No. 54, c. s.)

DIED.

Captain Charles P. Kretschmar, Thirteenth Regiment, June 9, 1887

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *July* 28, 1887.

GENERAL ORDERS, No. 24.

I. The annual inspection and muster of the organizations named below will take place as follows:

Ninth Separate Company, Whitehall, Monday, August 15, 2 P. M.

Thirty-eighth Separate Company, Oswego, Monday, August 15, 8 P. M.

Twenty-seventh Separate Company, Malone, Tuesday, August 16, 2 P. M.

Thirty-ninth Separate Company, Watertown, Tuesday, August 16, 2.30 P. M.

Thirty-fifth Separate Company, Ogdensburgh, Wednesday, August 17, 8 P. M.

Forty-first Separate Company, Syracuse, Thursday, August 18, 8 P. M.

Thirty-fourth Separate Company, Geneva, Tuesday, August 23, 2.30 P. M.

Twenty-fifth Separate Company, Canandaigua, Tuesday, August 23, 2.30 P. M.

Second Separate Company, Auburn, Tuesday, August 23, 8 P. M.

Eighth Separate Company, Rochester, Wednesday, August 24, 2.30 P.M.

Forty-third Separate Company, Olean, Thursday, August 25, 2.30 P. M.

Twenty-fourth Separate Company, Middletown, Friday, August 26, 2.30 P. M.

Fifth Separate Company, Newburgh, Monday, August 29, 8 P. M.

Nineteenth Separate Company, Poughkeepsie, Tuesday, August 30, 8 P. M.

Eleventh Separate Company, Mount Vernon, Thursday, September 1, 2.30 P. M.

Seventeenth Separate Company, Flushing, Friday, September 2, 8 P. M.

Thirteenth Regiment, Brooklyn, Saturday, September 3, 4 P. M.

II. Commanding officers will parade their respective commands in heavy marching order; cartridge-boxes will be worn in front; overcoats rolled on knapsacks; forage cap in the knapsack.

III. Commanding officers will prepare their muster rolls and forward the same promptly to the Inspector-General at Albany, as required by R. 593 (6th clause), and the attention of all officers is directed to section 5, par. I, of General Orders No. 4, c. s.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *July* 29, 1887.

GENERAL ORDERS, No. 25.

I. Privates Marlbro Walker, George A. Wilson and James F. Knudson, of Company H, Thirteenth Regiment, N. G., were separately tried before the general court-martial convened pursuant to S. O. No. 15, c. s. from these headquarters, and of which Captain William Haubennestel, Nineteenth Separate Company, was president, upon two charges. The first charge was disrespect to his superiors, accompanied by two specifications. The first specification charged that the accused did sign a writing requesting his superior and company commander to resign his said office. The second specification alleged that the accused did demand and ask of his company commander that he should resign his office. The second charge was, conduct prejudicial to good order and military discipline, with a specification alleging that the accused with other persons unknown did surreptitiously and wrongfully take and carry away the lock of the door of the room assigned for the use of Company H, in the regimental armory.

The court found Private Walker guilty on the first specification of the first charge, not guilty on the second specification of said charge; guilty on the first charge; guilty on the first specification of the second charge, and on the second charge.

The Commander-in-Chief approved the findings of guilty on the first specification of the first charge, and of not guilty on the second specification of said charge, and disapproved the finding of guilty on the first charge, and of guilty on the second charge and the specification thereunder.

The court found Private Knudson guilty on both specifications under the first charge, and not guilty on the second charge and the specification thereunder.

The Commander-in-Chief approved the findings of guilty on the two specifications under the first charge; disapproved the finding of guilty on the first charge, and approved the finding of not guilty on the second charge and the specification thereunder.

The court found Private Wilson guilty on the first specification of the first charge; not guilty on the second specification under such charge; guilty on the first charge, and guilty on the second charge and the specification thereunder.

The Commander-in-Chief approved the finding of guilty on the first specification of the first charge, and the finding of not guilty on the

second specification of said charge. He disapproved the finding of guilty on the first charge, and approved the finding of guilty on the second charge and the specification thereunder.

The sentences of the court in the cases of Privates Walker and Knudson, not being supported by an approved finding of guilty on any charge, were disapproved by the Commander-in-Chief. The sentence of the court in the case of Private Wilson was approved, and the punishment mitigated to a reprimand.

II. The evidence taken under the first charge was substantially the same in all three cases. The action of the accused in requesting the resignation of their company commander consisted in voting at a meeting of the civil organization in favor of a resolution reciting that the captain had offered to resign at the request of the company, and asking for his resignation. The captain was presiding at this meeting and received the resolution and put it to a vote without objection, calling for the "ayes" and "noes," and for a rising vote. Some time previous to this occurrence, the captain, finding a resignation blank upon his desk, called his command together and in substance told them, the accused being present, that if his resignation was required, resort need not be had to such indirect means, but it would be given by him at the request of the company when deemed for its best interests. It does not appear that the accused were concerned in the preparation or presentation of this resolution, or were actuated in voting as they did by any improper motive, or did anything other than express their opinion upon the question as put by the captain who, after the lapse of several months, charges them with a breach of military duty involving a disrespect to himself in the doing of this very act. There is no evidence to show any intentional disrespect on the part of the accused. Upon the facts of these cases, differing as they do materially from those previously presented, the Commander-in-Chief has felt called upon to withold his approval of the finding of guilty on the first charge.

The evidence taken under the second charge shows that the captain of the company changed the lock of the company room, thereby rendering useless the keys held by the members of his command. This fact being brought to his attention when presiding at a meeting of the civil organization, he stated in substance that he had so acted for the protection of public property, that he had no desire to keep anyone out of the room, and if the company had any objection to having it locked it could not come up at that meeting because it was a special one, but they would have to call another meeting to deal with the matter. Immediately after the adjournment of the special meeting,

the form of calling another was gone through with, and the three accused were appointed a committee to restore the lock to its former condition. The lock was then removed by a member of the company, apparently with the intention of changing its working and then restoring it, but before this was done the captain took action resulting in the present charges.

In the case of Private Knudson, there was no evidence to show that he was connected with the removal of the lock, and the finding of not guilty was proper and has been approved.

In the cases of Privates Walker and Wilson, the testimony shows that the accused, though they did not actually remove the lock, were present and approved and authorized the doing of the act.

In the case of Private Walker, the disapproval of the finding of guilty on the second charge is due solely to an irregularity in the taking of testimony in the absence of and without notice to the accused, and not to any doubt on the part of the Commander-in-Chief of the justice and propriety of the finding of the court upon the evidence.

In Private Wilson's case, the finding of guilty on the second charge is supported by the evidence and has been approved. It was the duty of Private Wilson in assuming the grave responsibility of interfering in a matter plainly under the control of his superiors, to act deliberately and only upon the fullest assurance of the latter's approval. The statement of his captain, to which reference has been made, was not the unqualified and deliberate direction necessary for the complete justification of Private Wilson's act. The words used were, however, unfortunately chosen, and had a tendency to mislead those who heard them. In consideration of this fact, and of the disapproval of the finding of guilty on the first charge, the Commander-in-Chief has mitigated the punishment imposed by the court to a reprimand. He stongly condemns the action of Private Wilson as presented upon the face of the proceedings. Giving due weight to all extenuating circumstances, his conduct shows a forgetfulness of his subordinate position, and evinces a spirit which, unless promptly repressed, will lead to more serious offenses, and subject him to severe punishment. This censure is equally applicable to those who took part with him in the action condemned by the finding of the court.

The Commander-in-Chief refrains from commenting on the conduct of the captain who commanded Company H, Thirteenth Regiment, at the time of these occurrences, in view of his death resulting from the serious illness which prevented his appearing and testifying on the trial of these cases.

He, however, calls the attention of the members of the National Guard to the unfortunate results which may follow the failure of those in command, to promptly and firmly repress all attempts of their subordinates to improperly interfere with or usurp their authority.

The Commander-in-Chief has been recently called on, in reviewing the records of courts-martial upon members of the Thirteenth Regiment, to repeatedly declare his disapproval of the conduct of members of that command. In disposing of the last of the pending cases, he expresses the hope that the examples of these trials will have the effect of subduing that spirit of insubordination and disregard of military duty, which has for the moment displayed itself, and he calls the attention of the members of the regiment, both officers and enlisted men, to the fact that on their orderly and exemplary conduct in the future will depend their usefulness as a military organization, and the place they are to hold in the estimation of their associates of the National Guard.

III. The court-martial before which these cases were tried is hereby dissolved, and Privates Walker, Wilson and Knudson are released from arrest.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *August* 3, 1887.

GENERAL ORDERS, No. 26.

I. The amendments to the Military Code passed by the Legislature of the State of New York, and contained in chapter 649 of the Laws of 1887, are hereby promulgated for the information and government of all concerned.

II. Sections 40, 93, 97 and 132, have been amended so as to read as follows :

§ 40. Able-bodied men of good character, of eighteen years of age and upwards, who can read and write, may be enlisted in the National Guard in the first instance for a term not less than five nor more than seven years, and, on the expiration of that term, they may be re-enlisted, either immediately or at any time thereafter, for terms of one or more years, at their option ; but no person above the age of

forty-five years shall be enlisted or re-enlisted except by permission of the commandant of the brigade or division to which the organization is attached; nor any person under the age of twenty-one years, without the consent of his parent or guardian; provided, however, that enlistments as musicians between the ages of sixteen and twenty-one years may be made with the consent of parents or guardians. Every enlisted man shall continue to be held to duty, and shall retain rank and be eligible to promotion after the expiration of his term of enlistment or re-enlistment, until he is actually discharged.

§ 93. The staff of the Commander-in-Chief (except the Adjutant-General, who shall be paid at an annual salary of four thousand dollars and his necessary expenses), and assistants in the several departments, in lieu of all compensation and allowances heretofore provided by law in time of peace, when upon actual duty under the provisions of this act either at drills, parades, encampments, lake or seacoast defense duty, or otherwise, shall be paid such reasonable and just compensation, not exceeding the full pay and allowances of officers of the same rank in the army of the United States, as the Commander-in-Chief shall deem proper, and in no event to exceed the sum of two thousand five hundred dollars per annum, together with their necessary expenses and those of their departments, to be paid by the State upon the certificate of the Commander-in-Chief, showing a detailed statement of such services and expenses.

§ 97. On the certificate of the Adjutant-General the Comptroller shall annually draw his warrant upon the Treasurer for the following sums, namely: Twelve hundred dollars for each division and for each brigade headquarters; two hundred and fifty dollars for each regimental headquarters; and one hundred dollars for each battalion headquarters; and two hundred and fifty dollars for each headquarters of provisional regiments or battalions. The funds thus allowed shall only be expended by the respective commanding officers, on the approval of the Adjutant-General.

§ 132. All fines and penalties imposed by any military court upon officers or enlisted men shall be paid by the officer collecting the same into the treasury of the county within which the regiment, battalion, troop, battery or company is located within thirty days after the collection thereof, and shall form a portion of and be credited to the military fund of the regiment, battalion, troop, battery or company of which the persons paying the fines and penalties are members, and the treasurer of such county shall thereupon report the amount thereof, designating the organization to which it belongs, to the Adjutant-General of the State. And the amount of fines or penalties

so collected from any other commissioned officers or enlisted men shall be paid by the officer collecting the same to the Treasurer of the State. The commanding officer of each regiment, battalion, troop, battery and company shall be responsible for all county property in his hands or under his control, provided under the provisions of this act, and shall, between the first and fifteenth days of July in each year, file with the treasurer of the county in which his command is located an inventory of such county property in his hands or used in his command. Each county treasurer shall, when any county property furnished for military purposes under this act is abandoned or is unfit for service, collect and store the same, and with the approval in writing of the officer commanding the brigade district of which his county forms a part, sell the same at public sale, and turn the net avails of said sale into the treasury of his county.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *August* 20, 1887.

GENERAL ORDERS, No. 27.

Permission is hereby granted all authorized military organizations of other States, to enter and pass through this State armed and equipped, going to and returning from the Constitutional Centennial Celebration, at Philadelphia, Pa., in September; and the National Drill and Encampment, at Chicago, Ill., in October, 1887.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *September* 1, 1887.

GENERAL ORDERS, No. 28.

The following changes have occurred during the months of July and August, 1887, among the commissioned officers of the National Guard, State of New York.

COMMISSIONED.

Ordnance Department.

Joseph G. Story, Assistant in the Department, with the rank of Colonel, with rank from January 20, 1880:

Second Brigade.

Gustave A. Jahn, Inspector, with the rank of Major, with rank from April 23, 1883, vice Denslow, relieved from duty.

Fritz Brosé, Commissary of Subsistence, with the rank of Major, with rank from July 5, 1887, vice Jahn, appointed Inspector.

Ninth Regiment.

Harry A. Ely, Captain, with rank from June 17, 1887, vice Kennedy, discharged.

Twelfth Regiment.

J. Amory Haskell, Commissary of Subsistence, with the rank of First Lieutenant, with rank from July 5, 1887, vice Deeves, resigned.

Thirteenth Regiment.

George G. Cochran, First Lieutenant, with rank from May 6, 1887, vice Stagg, resigned.

Fourteenth Regiment.

Ramon Cardona, Inspector of Rifle Practice, with the rank of Captain, with rank from July 17, 1865, vice Browe, resigned.

Twenty-second Regiment.

James W. Finch, Inspector of Rifle Practice, with the rank of Captain, with rank from May 16, 1887, vice Smith, resigned.

Joseph M. Smith, Commissary of Subsistence, with the rank of First Lieutenant, with rank from July 7, 1887, vice Jardine, promoted.

Malcolm C. Murray, Second Lieutenant, with rank from July 11, 1887, vice Finch, promoted.

Twenty-third Regiment.

William A. Underhill, First Lieutenant, with rank from June 17, 1887, vice Clark, resigned.

George A. Williams, First Lieutenant, with rank from July 11, 1887, vice Harron, resigned.

Clarence E. Hubbard, Second Lieutenant, with rank from July 11, 1887, vice Williams, promoted.

Forbes Dunderdale, Second Lieutenant, with rank from July 15, 1887, vice Hungerford, resigned.

Thirty-second Regiment.

Robert H. McKittrick, First Lieutenant, with rank from June 24, 1887, vice Goedel, resigned.

Forty-seventh Regiment.

Emile F. Christoffel, First Lieutenant, with rank from June 27, 1887, vice Roe, transferred.

Sixty-fifth Regiment.

Samuel M. Welch, Jr., Colonel, with rank from August 1, 1887, vice Waud, discharged.

Sixty-ninth Regiment.

Francis J. Magee, Second Lieutenant, with rank from May 26, 1887, vice Goggin, resigned.

Seventy-first Regiment.

Frederick Kopper, Colonel, with rank from July 19, 1887, vice McAlpin, resigned.

Twenty-sixth Separate Company.

Floyd B. Parke, Assistant Surgeon, with the rank of First Lieutenant, with rank from May 20, 1887, vice Watkins, resigned.

Thirtieth Separate Company.

Edward M. Hoffman, First Lieutenant, with rank from May 11, 1887, vice Prall, resigned.

John T. Sadler, Second Lieutenant. with rank from May 11, 1887 vice Knox, resigned.

Forty-third Separate Company.

Selden Johnson Mudge, Assistant Surgeon, with the rank of First Lieutenant, with rank from April 12, 1887, Original.

RESIGNED.

DATE.	Regiment.	Brigade.	Name.	Office.
1887.				
July 12..	23d Regiment ...	2	H. P. Hungerford.....	Second Lieutenant.
July 15..	32d Regiment....	2	S. R. Blumke	First Lieutenant.
July 18..	71st Regiment...	1	Charles A. Hess.....	Captain and I. R. P.
July 20..	71st Regiment...	1	Charles E. Brown.....	First Lieut. and Q. M.
July 20..	71st Regiment...	1	George L. McAlpin	First Lieut. & Com. of Sub.
July 23..	14th Regiment...	2	E. M. Christensen.....	First Lieutenant.
July 23..	27th Sep. Co.....	3	Frederick D. Kilburn.....	First Lieutenant.
Aug. 2..	14th Regiment...	2	William J. Leonard.....	Second Lieutenant.
Aug. 10..	74th Regiment...	4	Charles F. E. Menge.....	Second Lieutenant.
Aug. 18..	9th Regiment....	1	Alfred Chamberlain.....	Captain.
Aug. 19..	12th Regiment...	1	W. Wheeler De Forest....	Captain and I. R. P.
Aug. 19..	8th Regiment....	1	M. Van Rensselaer, Jr....	Captain.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:
ADJUTANT-GENERAL'S OFFICE,
ALBANY, *September* 13, 1887.

GENERAL ORDERS, No. 29.

I. The annual inspection and muster of the organizations named below, will take place as follows:

Tenth Battalion, Albany, Friday, September 30, 8 P. M.

Twentieth Separate Company, Binghamton, Monday, October 3, 8 P. M.

Sixth Battery, Binghamton, Tuesday, October 4, 8 P. M.

Thirty-third Separate Company, Walton, Wednesday, October 5, 2 P. M.

Third Separate Company, Oneonta, Thursday, October 6, 2 P. M.

Twenty-third Regiment, Brooklyn, Monday, October 10, 8 P. M.

Fourteenth Regiment, Brooklyn, Tuesday, October 11, 3 P. M., at Prospect Park parade grounds.

Thirty-second Regiment, Brooklyn, Wednesday, October 12, 3 P. M., at Prospect Park parade grounds.

Third Battery, Brooklyn, Thursday, October 13, 8.30 P. M.

First Battery, New York, Friday, October 14, 8 P. M.

Second Battery, New York, Monday, October 17, 8 P. M.

Forty-seventh Regiment, Brooklyn, Tuesday, October 18, 8 P. M.

Eleventh Regiment, New York, Wednesday, October 19, 2.30 P. M., on grounds suitable for field manœuvres.

Sixty-ninth Regiment, New York, Thursday, October 20, 2.30 P. M., on grounds suitable for field manœuvres.

Seventy-first Regiment, New York, Friday, October 21, 8 P. M.

Twelfth Regiment, New York, Monday, October 24, 8 P. M.

Eighth Regiment, New York, Tuesday, October 25, 2.30 P. M., on grounds suitable for field manœuvres.

Ninth Regiment, New York, Wednesday, October 26, 8 P. M.

Twenty-second Regiment, New York, Wednesday, Nov. 2, 2.30 P. M.

Seventh Regiment, New York, Tuesday, November 22, 8 P. M.

II. Commanding officers will parade their respective commands in heavy marching order; cartridge boxes will be worn in front; overcoats rolled on knapsacks; forage cap in the knapsack.

III. Commanding officers will prepare their muster rolls and forward the same promptly to the Inspector-General at Albany, as required by R. 593 (6th clause), and the attention of all officers is directed to section 5, part 1, of General Orders No. 4, C. S.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General

GENERAL HEADQUARTERS, STATE OF NEW YORK :

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *October* 1, 1887.

GENERAL ORDERS, No. 30.

The following changes have occurred during the month of September, 1887, among the commissioned officers of the National Guard, State of New York :

COMMISSIONED.

Eighth Regiment.

George C. Heilner, First Lieutenant, with rank from June 20, 1887, vice Howe, promoted.

Eleventh Regiment.

Jarvis W. Mason, First Lieutenant, with rank from July 1, 1887, vice Mooney, promoted.

Twelfth Regiment.

Rufus Delafield, Captain, with rank from August 10, 1887, vice Haskell, appointed Commissary of Subsistence.

Louis G. Brigg, Second Lieutenant, with rank from August 29, 1887, vice Wing, transferred.

Henry G. Paine, Second Lieutenant, with rank from August 26, 1887, vice Roosevelt, promoted.

Thirteenth Regiment.

William H. A. Cochran, Captain, with rank from July 6, 1887, vice Kretchmar, deceased.

Frank R. Wiswell, Second Lieutenant, with rank from August 16, 1887, vice Spier, resigned.

Fourteenth Regiment.

Austin O. Crane, Captain, with rank from August 15, 1887, vice Cardona, appointed Inspector of Rifle Practice.

Thirty-second Regiment.

Edward J. Renison, Captain, with rank from August 9, 1887, vice Strining, resigned.

Charles G. Schoneck, First Lieutenant, with rank from August 26, 1887, vice Bluemke, resigned.

John Rooney, Second Lieutenant, with rank from August 9, 1887, vice Seibert, resigned.

George D. Russell, Second Lieutenant, with rank from August 12, 1887, vice McKittrick, promoted.

Alexander Mitzel, Jr., Second Lieutenant, with rank from August 12, 1887, vice Scherer, resigned.

Forty-seventh Regiment.

Alfred C. Harrison, Jr., Second Lieutenant, with rank from August 9, 1887, vice Barlow, promoted.

Homer L. Bartlett, Second Lieutenant, with rank from August 24, 1887, vice Clarry, resigned.

Ninth Separate Company.

Thomas A. Paterson, First Lieutenant, with rank from June 15, 1887, vice Davis, resigned.

Thirty-fifth Separate Company.

Dennis B. Lucey, Second Lieutenant, with rank from July 14, 1887, vice Proctor, promoted.

RESIGNED.

DATE.	Regiment.	Brigade.	Name.	Office.
1887.				
Sept. 19..	2d Battery	1	Emil A. Bracklow.....	First Lieut. & Asst. Surg.
Sept. 19..	71st Regiment...	1	Fred. W. Gwyer.....	Capt. and Asst. Surgeon.
Sept. 19..	71st Regiment...	1	Marvin R. Vincent.....	Captain and Chaplain.
Sept. 19..	8th Sep. Co	4	Albert R. Gumberts	First Lieut. & Asst. Surg.
Sept. 21..	10th Batt'n	3	A. K. Sangmaster.....	First Lieutenant.
Sept. 27..	4th Sep. Co	3	Raffaelle Cobb	Captain.
Sept. 27..	29th Sep. Co	4	Pardon T. Perkins.....	Second Lieutenant.
Sept. 28..	13th Regiment ..	2	Edward Fackner.....	Colonel.

DIED.

Captain John Meury, Chaplain Thirty-second Regiment, May 19, 1887.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *October* 15, 1887.

GENERAL ORDERS, No. 31.

I. During the current drill season the following rules will be observed and enforced by commanding officers:

Schools of instruction for officers will be established by the commanding officers of regiments, battalions, batteries and separate companies, for the officers of their respective commands; these schools will be held at least once in each month.

Commanding officers of regiments, battalions, batteries and separate companies, will also establish, or cause to be established, schools of instruction for the non-commissioned officers of their respective commands, which shall be held at least once in each month.

Recruits will be instructed in sighting and aiming, and in the duties of sentinels, and will not be permitted to drill with their companies until they are thoroughly conversant with the school of the soldier.

When practicable, instruction in the trumpet signals will be given, so that officers and men shall recognize them when sounded.

Commanding officers of organizations which were not in camp this season, will pay special attention to the theoretical and, if possible, practical instruction of their commands in skirmishing, guard mounting and guard duties.

Brigade commanders, in person or through staff officers, will see that these directions are strictly complied with.

II. To prepare for the next season's rifle practice, and recognizing the necessity of more thorough preliminary instruction, theoretical instruction is prescribed as follows:

Commanders of companies and batteries armed with rifles will at least once in each month during the current drill season instruct their commands in rifle practice. Inspectors of rifle practice will assist the commanding officers of the companies of their respective regiments and battalions, those of brigades the commanding officers of the separate companies and batteries of their respective brigades, as instructors.

The instruction will be according to paragraphs 165 and 167, Upton's Infantry Tactics, and as follows:

SIGHTING.

1. A sand bag for each squad (one twelve-pound or two six-pound bags) will be placed on a rest, which may be a table, a tripod, or a stack of arms, and so arranged that the bag will be about four and one-half feet from the ground.

The men will be formed in single rank, and in squads not to exceed ten men in each.

The instructor will then flatten the sand bag with the back of his hand, lay a full cocked rifle on it, aim at some small object at as great a distance from it as the drill-room will permit (a wafer on the wall for instance), and explain to the men the following simple rules:

The sights should not incline to the right or left.

The line of sight should be taken along the centre of the notch of the rear-sight and the top of the front-sight, which should cover the middle of the mark aimed at.

The eye should be fixed on the mark, and not on the front-sight. Particular attention should be paid to this rule, as beginners are apt to fix the eye on the front-sight and not on the mark, which prevents the latter from being distinctly seen, and greatly increases the difficulty in aiming.

2. The instructor will also explain the different kinds of sights, viz.:

Fine Sight.—When the point of the front-sight is just seen through the notch of the rear-sight, the effect of which is to shoot low.

Full Sight.—When the whole of the wedge-shaped portion of the front-sight is displayed through the notch on the rear-sight, the effect of which is to shoot high.

Half Sight.—When but half the front-sight is seen.

3. At times during this drill the leaf of the rear sight should be required to be raised.

AIMING.

(One.) Come to the position of ready, and raise the leaf of the rear-sight.

(Two.) Raise the rifle smartly in front of the right shoulder to the full extent of the left arm, without moving the body, head, or eye; the arms to move close to the body; barrel nearly horizontal and pointing a few inches below the mark; the eyes fixed upon the forefinger inside the trigger-guard; both elbows inclined downward.

(Three.) Press the piece smartly with both hands against the hollow of the shoulder, which must neither be allowed to give way nor pressed forward or raised to meet it; the left elbow at the same time being brought as far under the rifle as is possible without assuming an unnatural position; the right elbow slightly raised, being nearly square with the right shoulder; the center (or rather the upper than lower) part of the butt to be pressed firmly against the shoulder with the left hand without touching the collar-bone, the top of the butt being as nearly as possible even with the top of the shoulder; the forefinger will be placed around the trigger like a hook, but without pressing it; the head and body will be kept perfectly perpendicular the whole time, no attempt being made to look through the sights.

(Four.) Close the left eye and incline the head to the right over the small of the stock so that the right eye may quickly perceive the coincidence of the rear and front sights and the object aimed at.

(Five.) Raise the head, look squarely to the front and bring the piece smartly to the first position.

Practice in aiming will be continued until the men aim quickly and correctly from the shoulder.

The instructor will also give such further instruction as his experience may suggest.

Wherever gallery practice is practicable it should be encouraged.

Brigade, as well as regimental and battalion commanders, are charged with the proper execution of the foregoing.

The General Inspector of Rifle Practice will arrange for the instruction of officers in rifle practice, when deemed necessary by him, through the respective brigade commanders.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *October* 28, 1887.

GENERAL ORDERS, No. 32.

The following decisions of the War Department are published for the information and guidance of all concerned.

The numbers of each section indicate its appropriate place in the book of decisions published February 5, 1887.

4*a*. *Hoisting a flag to and lowering it from half-staff.*— The flag should be hoisted to the top of the staff and then lowered to half-staff at the instant of the firing of the reveille gun; it should be hoisted to the top and immediately lowered at the firing of the retreat gun; or in case of a funeral salute at retreat it should be hoisted and then lowered immediately after the last gun of the salute. *(General decision, letter February* 19, 1887 — 597 *A. G. O.*, 1887.)

4*b*. *Position of flag at half-staff.*— A flag at half-staff should be displayed at a point midway between the truck and the cross-trees. *(Decision Lieut.-Gen., letter April* 9, 1887 — 1431 *A. G. O.*, 1887.)

4*c*. Manœuvering in restricted drill-rooms and other contracted places may sometimes necessitate some simple movements not laid down in the tactics in order to change the position or formation of troops. Expedients for such purposes could well be left to the discretion of the commanding officer, and it would be unwise to prescribe how and by what commands they should be executed. (1163 *A. G. O.*, 1887.)

5*a*. The adjutant does not return his sword when reading orders at dress parade. During the publication of the orders he drops the sword; which is held suspended by the sword-knot attached to the

wrist. After he has folded up and put away the orders, he resumes the "carry," then faces about and salutes his colonel with his sword, and reports, "Sir, the orders are published." (1332 *A. G. O.*, 1887.)

6*a*. Paragraph 758, Infantry Tactics, referring to the manner of carrying the sword, applies to dismounted officers only. (1196 *A. G. O.*, 1887.)

8*a*. A battalion of infantry being at parade rest, the mounted officers remain at a "carry." (1196 *A. G. O.*, 1887.)

8*b*. Battalion being in line, at the command "Backward, guide center, march," the captains retain their positions and step backward at the command "March." (*Letter, April* 30, 1887 — 2201 *A. G. O.*, 1887.)

17*a*. At the above command ("Backward, guide center, march") the color-bearer and general guides retain their positions in front of the battalion, and step backward at the command "March." In regard to the above two questions (8*b* and 17*a*) it may be remarked that the back step is only used to gain a few steps to the rear (see paragraph 49), and to march the battalion a few paces to the rear the officers, color-bearer, general guides, guides, and file-closers remain in their positions (see paragraph 401). (*Letter, April* 30, 1887 — 2201 *A. G. O.*, 1887.)

18*a*. Battalion marching to the front in line, at a right shoulder, the general guides carry their pieces at a right shoulder. (*Letter, April* 30, 1887 — 2201 *A. G. O.*, 1887.)

20*a*. The first sergeant should salute the captain on receiving orders to dismiss the company. (1332 *A. G. O.*, 1887.)

28*a*. The first sergeant does not come to "arms port" in dismissing company. (1332 *A. G. O.*, 1887.)

28*b*. Battalion in line: At the command "Rear open order, march," the left sergeant and the left file-closer face to the front. (*Letter, April* 2, 1887 — 1614 *A. G. O.*, 1887.)

31*a*. Paragraph 212. In wheeling by fours, the guides should wheel as directed in paragraph 228. (*Letter, August* 12, 1887 — 4296 *A. G. O.*, 1887.)

32*a*. Battalion marching in column of companies, guide left, arms at right shoulder, the right and left guides of companies do not change the position of their pieces at the command "Right oblique, march," or at the command "Column left, march," during the wheel of each company. (*Letter, April* 30, 1887 — 2201 *A. G. O.*, 1887.)

33*a*. Companies, left into line wheel, from a halt: The movement is executed toward the guides, who would be at a "carry" before its commencement. (*Letter, April* 13, 1887 — 1738 *A. G. O.*, 1887.)

33*b*. Company marching in line, quick time, guide left, arms at right shoulder: At the command "Left wheel, march," the guides on the marching flank should not bring his piece to a "carry." The left guide will be already at a "carry." When the guide is temporarily changed during a wheel or an oblique, the temporary guide, if at a right shoulder, etc., does not come to a "carry." (2645 *A. G. O.*, 1887.)

33*c*. Ordinarily the wheel into line from a column at full distance is made toward the guides, who would be at a "carry" before the commencement of the wheel. If all the arms are at a "right shoulder" in a column at full distance and at a halt, and a wheel into line is ordered before indicating the guide or ordering the guides to cover, then both guides of each company would be at a "right shoulder," and would both come to a "carry" at the command "Company halt." (*Letter, April* 30, 1887 — 2201 *A. G. O.*, 1887.)

33*d*. To form column of platoons to the right or left (paragraph 255): The guides on the marching flanks of platoons do not come to a "carry" at the first command. (2699 *A. G. O.*, 1887.)

49*a*. Paragraph 54. Although the *about* by company is recognized in paragraph 54, Infantry Tactics, yet as it is not mentioned in the school of the company, and as there are no commands prescribed for it, it is not a proper movement in that school. *(Decision Lieut.-Gen., letter, August* 12, 1887 — 4452 *A. G. O.*, 1887.)

61*a*. Company in line at halt, arms at "carry," command "right (or left) oblique, double time." The half face is executed at the command "right (or left) oblique;" the arms are brought to a "right shoulder" at the command "double time." (2699 *A. G. O.*, 1887.)

65*a*. "Fix bayonets" should not be executed on the march as a means of instruction in the manual. *(Letter, April* 23, 1887 — 2039 *A. G. O.*, 1887.)

66*a*. Paragraph 72. It being difficult to get a firm hold on the piece fitted with the new sight leaf, by clasping it "immediately below the lower band" in *charge bayonet* and *arms port*, the hand should grasp it just above the rear sight. *(Letter, August* 12, 1887 — 4296 *A. G. O.*, 1887.)

66*b*. Paragraph 81. The men are not permitted to look down at the scabbard to sheathe their bayonets. *(Decision Lieut.-Gen., September* 24, 1887.)

67*a*. *Secure arms.*—In executing secure arms, the toe of the piece in the first part of the first motion, should be toward the body, *i. e.*, the left. *(Circular No.* 2, *U. S. Infantry and Cavalry School*, 1884, *and Mem. of decision of November* 9, 1885.)

68*a*. At "trail arms" the little finger should be in rear of the barrel. (*Letter, April* 9, 1887—1908 *A. G. O.*, 1887.)

68*b*. Paragraph 90. In *left reverse arms* it is more convenient to change hands in front of the center of the body. (*Letter, August* 12, 1887—4296 *A. G. O.*, 1887.)

86*a*. Paragraph 92. The cartridge-box is not moved to the front in the execution of the "load." (*Decision Lieut.-Gen., September* 24, 1887.) Preparatory to loading, the box may be moved to the front; see first clause section 77, book of decisions.

88*a*. In executing the "load," etc., by the numbers, the subdivision of the motions relative to the cartridge should not be authorized. It is plainly to be inferred from the third paragraph, page 31, Infantry Tactics, that the same regularity is not expected in the execution of the motions relative to the cartridge and bayonet as in the execution of the other parts of the manual. Clock-like regularity in these motions can only be obtained by an expenditure of time that could be better employed in more useful instruction to the soldier. (1325 *A. G. O.*, 1887.)

88*b*. In executing the load it is customary simply to carry the hand to the cartridge-box without opening it, when cartridges are not used. (1579 *A. G. O.*, 1887.)

103*a*. At the command "cease firing," the piece is brought to the safety-notch before closing the cartridge-box. (1325 *A. G. O.*, 1887.)

107*a*. Paragraphs 124 and 125. In executing "front open files," Nos. 1, 2, 3 and 4, move straight to the front. (*Decision Lieut.-Gen., circular No.* 9, 1887.)

115*a*. Paragraph 195. In dressing to the right or left the men turn the head and eyes, but keep the shoulders square to the front. (*Decision Lieut.-Gen., September* 24, 1887.)

117*a*. In facing to the rear the fours halt at command after executing the "about." (*Letter, April* 13, 1887—1738 *A. G. O.*, 1887.)

120*a*. Paragraph 237. Column of fours cannot be formed from column of twos at a halt. (*Decision Lieut.-Gen., September* 24, 1887.)

122*a*. Paragraphs 238 and 239, Infantry Tactics, prescribe that in forming column of twos from column of files, in double-rank formation, the leading file advances three yards and halts, the movement being necessarily a successive one. While it is practicable to execute this movement simultaneously in single-rank formation, it is believed to be the general practice in the service to execute it successively in accordance with the directions in paragraphs 238 and 239, taken in connection with paragraph 247. (1325 *A. G. O.*, 1887.)

122*b*. Paragraph 238. In forming fours (or twos) "left oblique" from column of files, double rank formation, the "successive formation" applies to the beginning of the oblique as well as to the halting. (*Decision Lieut.-Gen., September* 24, 1887.)

124*a*. Paragraph 253. In "left front into line" from a halt the fours do not make a half face to the left at the preparatory command. (*Decision Lieut.-Gen., September* 24, 1887.)

127*a*. Paragraphs 245 and 246. Relative to the distance and step in forming single rank from double, in either column of fours or company front, the preservation of the proper distance between sets of fours is of much more importance than the preservation of the step. In moving forward from a halt the march is always begun with the left foot. (*Decision Lieut.-Gen., September* 27, 1887.)

132*a*. Paragraph 300. A line of skirmishers marching by the flank, no guide marches by the side of either the right or left skirmisher. The file-closers preserve the distance of ten yards to the right or left of the line. It is only while deploying by the flanks that the leading skirmisher is accompanied by a guide. (*Decision Lieut.-Gen., circular No.* 9, 1887.)

133*a*. Paragraph 326. At the command "rally by fours" file-closers should fix-bayonets. (*Decision Lieut.-Gen., circular No.* 9, 1887.)

136*a*. Paragraph 338. In deploying a battalion in column of fours as skirmishers front into line, the column of fours is not changed into column of companies, but each company executes right or left front into line, when it arrives opposite its interval and then deploys. (*Decision Lieut.-Gen., September* 26, 1887.)

146*a*. A battalion in line without color-guard and color-bearer should march as provided for a battalion advancing to an attack (paragraph 410); the guide of the battalion would be the non-commissioned officer between the right and left center companies, the basis of alignment would be the captains of the right and left center companies, and the front rank of the left set of fours of the right center company. (*Letter, April* 2, 1887 — 1614 *A. G. O.*, 1887.)

146*b*. With a battalion marching in line, when broken to pass an obstacle, it should be left to the discretion of the colonel to provide for the proper direction of march of his battalion and for the preservation of the interval for the rear companies during the temporary absence of the color-guard from the line. (*Letter, April* 2, 1887—1614 *A. G. O.*, 1887.)

148*a*. In successive battalion formations the designation of a company changes after the command "Guides posts," which ends the movement. (*Letter, April* 27, 1887—2170 *A. G. O.*, 1887.)

153*a*. To reform the line after advance by right of wings: At the command "Left front into line," markers should be established for both wings and the guides should come out. The markers established by the field officer of the directing wing give the line of direction for the markers of the other wing. (2596 *A. G. O.*, 1887.)

155*a*. Paragraph 757. *Cavalry Tactics.*—The captains remain on the flanks of their companies till the command "Guides posts" is given. When dressing their companies, the captains face to the front, as prescribed by paragraph 716, Cavalry Tactics. (*Decision Lieut.-Gen., September* 27, 1887.)

160*a*. In brigade line, battalions are posted from right to left according to the rank of the colonels, the senior colonel on the right, the junior on the left. (1196 *A. G. O.*, 1887.)

167*a*. *Saluting a Regimental Adjutant.*—The office of adjutant gives no right of precedence. All first and second lieutenants rank according to date of commission in their respective grades. (*General decision, letter April* 13, 1887—1738 *A. G. O.*, 1887.)

170*a*. A company marching meets the colonel commanding, or other person entitled to a salute, the captain should bring the company to a "carry," and himself salute the commanding officer and all general officers. The guides and file-closers do not salute. (1332 *A. G. O.*, 1887.)

182*a*. *Daily dress parades and roll-calls.* — Unless for some urgent reason, paragraph 513 of the Regulations should be always strictly complied with. The discretion accorded to post commanders by paragraph 344 of the Regulations, in dispensing with dress parades, only authorizes their omission where the weather is too inclement or the conditions of service such that the parade is impracticable. It gives no authority for their systematic omission on particular days of the week. (*Decision Lieut.-Gen., letter June* 9, 1887 — 3163 *A. G. O.*, 1887.)

186*a*. In forming line at dress parade of two companies, the formation is central, and the captain of the first company should dress it to the left. (963 *A. G. O.*, 1887.)

190*a*. On the parade for review of a brigade or battalion, or other body of troops less than a brigade, the commanding officer, when presenting his command to the reviewing officer, will have his sword drawn, and all officers of the command on parade will likewise have their swords drawn. The swords will remain drawn throughout the review, and will not be sheathed *until the parade is dismissed.* The commanding officer of the troops to remain at attention in front of his command, facing to the front while the reviewing party passes around the lines. For the review of a body of troops greater than a

single brigade, it should be left to the general commanding to arrange all details so as to conform to the existing situation. (*Decision Lieut.-Gen.* — 6780 *A. G. O.*, 1886.) (*Circular No.* 5, 1887.)

190*b*. Paragraphs 815 and 826. It was distinctly the intention of so much of circular No. 5, Adjutant-General's Office, June 10, 1887, as refers to parade for review of a brigade or battalion, to revoke and alter so much of paragraphs 815 and 826 as are in conflict with that circular, and to return to the forms and methods which prevailed previous to the adoption of the tactics now in force. (*Decision Lieut.-Gen., letter August* 17, 1887 — 3882 *A. G. O.*, 1887.)

192*a*. At the review of a brigade each battalion is brought to a "carry" when the head of the battalion is fifty yards from the "post of review." The point where the battalions of a brigade are brought to a "carry" is indicated by a camp color. At the review of a single battalion the arms are at a "carry" all the time during the march past. (2594 *A. G. O.*, 1887.)

226*a*. *Uniform of Chaplains.*— Existing regulations do not permit the wearing of swords or regimental badges by chaplains. (*Decision Lieut.-Gen., September* 24, 1887.)

By order of the Commander-in-Chief,

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK :

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *November* 1, 1887.

GENERAL ORDERS, No. 33.

The following changes have occurred during the month of October, 1887, among the commissioned officers of the National Guard, State of New York :

COMMISSIONED.

First Brigade.

Robert W. Leonard, Assistant Adjutant-General, with the rank of Lieutenant-Colonel, with rank from October 6, 1887, vice Barber, resigned.

Fourth Brigade.

Edson J. Weeks, Commissary of Subsistence, with the rank of Major, with rank from October 18, 1887, original.

Second Battery.

Michael T. Carroll, Assistant Surgeon, with rank of First Lieutenant, with rank from September 30, 1887, vice Bracklow, resigned.

Third Battery.

Walter F. Barnes, Second Lieutenant, with rank from September 26, 1887, vice Toshach, discharged.

Ninth Regiment.

Emil J. Winterroth, Second Lieutenant, with rank from June 15, 1887, vice Morgan, resigned.

Tenth Battalion.

G. James Greene, First Lieutenant, with rank from October 15, 1887, vice Sangmaster, resigned.

Eleventh Regiment.

Robert A. Elliott, First Lieutenant, with rank from October 4, 1887, vice de V. Parker, discharged.

William J. Burns, Second Lieutenant, with rank from October 4, 1887, vice Christensen, promoted.

Twelfth Regiment.

Charles M. Jesup, First Lieutenant, with rank from July 13, 1887, original.

Frederic Foster Carey, First Lieutenant, with rank from September 29, 1887, vice Delafield, promoted.

Thirteenth Regiment.

George C. Broome, Second Lieutenant, with rank from September 16, 1887, vice Cochran, promoted.

Thirty-second Regiment.

Emil Arnold Meury, Chaplain, with the rank of Captain, with rank from September 30, 1887, vice John Meury, deceased.

Sixty-fifth Regiment.

John E. Robie, Lieutenant-Colonel, with rank from September 15, 1787, vice Welch, promoted.

Seventy-first Regiment.

James A. Dennison, Lieutenant-Colonel, with rank from September 15, 1887, vice Kopper, promoted.

Philip S. Tilden, Adjutant, with the rank of First Lieutenant, with rank from March 10, 1887, vice Downs, promoted.

Edgar S. Auchincloss, Commissary of Subsistence, with the rank of First Lieutenant, with rank from August 1, 1887, vice McAlpin, resigned.

William E. D. Stokes, Quartermaster, with the rank of First Lieutenant, with rank from August 1, 1887, vice Brown, resigned.

Charles H. Hoyt, Inspector of Rifle Practice, with the rank of Captain, with rank from August 1, 1887, vice Hess, resigned.

William R. Pryor, Assistant Surgeon, with the rank of Captain, with rank from October 1, 1887, vice Gwyer, resigned.

Edward J. Little, Second Lieutenant, with rank from May 3, 1883, vice Whitney, resigned.

Third Separate Company.

Edwin G. Bixby, Second Lieutenant, with rank from September 21, 1887, vice Mattice, promoted.

Thirteenth Separate Company.

William Marvin Bemus, Assistant Surgeon, with the rank of First Lieutenant, with rank from September 23, 1887, original.

Twenty-seventh Separate Company.

George W. Crooks, First Lieutenant, with rank from October 6, 1887, vice Kilburn, resigned.

Thirty-second Separate Company.

Lourie Ashton, Assistant Surgeon, with the rank of First Lieutenant, with rank from August 20, 1887, original.

Fortieth Separate Company.

James Myall, First Lieutenant, with rank from July 5, 1887, vice Blakeley, elected First Lieutenant Forty-first Separate Company.

Forty-fourth Separate Company.

Daniel T. Everts, Captain, with rank from September 27, 1887, original.

John Cummings, Jr., First Lieutenant, with rank from September 27, 1887, original.

Edmond A. O'Brien, Second Lieutenant, with rank from September 27, 1887, original.

RESIGNED.

DATE.	Regiment.	Brigade.	Name.	Office.
1887.				
Oct. 5..	13th Regiment...	2	Samuel W. Smith.....	Captain.
Oct. 5..	.....	1	Thomas H. Barber.....	Lieut.-Col. and A. A. G.
Oct. 6..	15th Sep. Co.....	3	Charles Ulrich	First Lieutenant.
Oct. 19..	13th Regiment...	2	Henry C. Clark.....	First Lieut. and Adjutant.
Oct. 24..	11th Regiment...	1	Julius Hochman.....	First Lieutenant.
Oct. 24..	65th Regiment...	4	George W. Pattison.....	Captain and Ass't Surgeon.
Oct. 25..	23d Regiment....	2	Alexander S. Bacon.....	Lieutenant-Colonel

ASSIGNED TO DUTY.

Captain Frederick T. Leigh, Supernumerary Officer, as Signal Officer Second Brigade (S. O. No. 86).

RELIEVED FROM DUTY.

Captain Julius J. Herbold, Supernumerary Officer, as Assistant Inspector of Rifle Practice, Sixty-fifth Regiment (S. O. No. 91, c. s.).

DIED.

Captain Sullivan H. Weston, Chaplain, Seventh Regiment, October 14, 1887,

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By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *December* 1, 1887.

GENERAL ORDERS, No. 34.

The following changes have occurred during the month of November, 1887, among the commissioned officers of the National Guard, State of New York:

COMMISSIONED.

Second Battery.

Oscar L. Rogers, Second Lieutenant, with rank from September 29, 1887, vice Henderson, resigned.

Seventh Regiment.

John R. Paxton, Chaplain, with the rank of Captain, with rank from November 16, 1887, vice Weston, deceased.

Eighth Regiment.

W. de Lancey Cunningham, Captain, with rank from November 16, 1887, vice Van Rensselaer, resigned.

Ninth Regiment.

James G. McMurray, Second Lieutenant, with rank from October 17, 1887, vice Ely, promoted.

Tenth Battalion.

Albert E. Batchelder, Second Lieutenant, with rank from November 12, 1887, vice Greene, promoted.

Eleventh Regiment.

James M. Rankin, First Lieutenant, with rank from October 10, 1887, vice Menzel, promoted.

Walter L. Miller, First Lieutenant, with rank from November 9, 1887, vice Hochman, resigned.

Percy P. May, Second Lieutenant, with rank from November 18, 1887, vice Mason, promoted.

Twelfth Regiment.

Arthur E. Schuman, First Lieutenant, with rank from October 18, 1887, vice Haskell, promoted.

William F. Catterfield, Second Lieutenant, with rank from October 27, 1887, vice Carey, promoted.

Fourteenth Regiment.

Edward Bennett, Captain, with rank from September 22, 1887, vice himself, resigned.

Hassell Nutt, Captain, with rank from October 10, 1887, vice Limburger, resigned.

Charles W. Bridges, Second Lieutenant, with rank from October 17, 1887, vice Steers, promoted.

Twenty-third Regiment.

John N. Partridge, Colonel, with rank from October 17, 1887, vice Fincke, resigned.

Thirty-second Regiment.

Edward J. McGlynn, First Lieutenant, with rank from October 8, 1887, vice Rennison, promoted.

William Finkelmeir, Second Lieutenant, with rank from October 18, 1887, vice Martin, resigned.

Forty-seventh Regiment.

Charles L. Spier, First Lieutenant, with rank from October 10, 1887, vice Christoffel, promoted.

Sixty-fifth Regiment.

William T. Parsons, Major, with rank from October 27, 1887, vice Robie, promoted.

Allison K. Hume, Captain, with rank from October 10, 1887, vice Mason, resigned.

Floyd S. Crego, Assistant Surgeon, with the rank of Captain, with rank from October 25, 1887, vice Pattison, resigned.

Charles E. P. Babcock, Captain, with rank from November 21, 1887, vice Parsons, promoted.

Albert J. Myer, First Lieutenant, with rank from November 15, 1887, vice Carr, resigned.

Seventy-first Regiment.

John Noble Golding, Second Lieutenant, with rank from October 14, 1887, vice Hagan, resigned.

Clinton H. Smith, First Lieutenant, with rank from October 18, 1887 vice Tilden, appointed Adjutant.

Fourteenth Separate Company.

Theodore Du Bois Frear, Second Lieutenant, with rank from November 3, 1887, vice Van Etten, promoted.

RESIGNED.

DATE.	Regiment.	Brigade.	Name.	Office.
1887.				
Nov. 7..	32d Regiment ...	2	Fred'k W. Parisette.....	Major.
Nov. 7..	13th Sep. Co.....	4	August W. Ljungberg....	First Lieutenant.
Nov. 7..	65th Regiment ..	4	Elmer E. Seaman.....	First Lieutenant.
Nov. 7..	13th Sep. Co.....	4	John Cadwell.....	Second Lieutenant.
Nov. 14..	23d Regiment ...	2	Edgar F. Haviland.....	Captain.
Nov. 14..	12th Regiment...	1	McCoskry Butt.....	First Lieutenant.
Nov. 15..	32d Regiment....	2	Edward M. Wunder.....	Lieutenant-Colonel.
Nov. 15..	65th Regiment...	4	William H. Hicks, Jr.....	First Lieutenant.
Nov. 15..	65th Regiment...	4	John V. Carr.....	Second Lieutenant.
Nov. 17..	26th Sep. Co.....	4	Eugene Root	Captain.
Nov. 21..	27th Sep. Co.....	3	William H. Barney	Captain.
Nov. 21..	8th Regiment ...	1	Frank Pentz.....	First Lieutenant.
Nov. 30..	9th Regiment ...	1	Frank A. Gale.....	First Lieutenant.
Nov. 30..	9th Regiment ...	1	William H. Anketell.....	Second Lieutenant.
Nov. 30..	22d Regiment....	1	Isaac H. West.....	Captain.
Nov. 30..	22d Regiment....	1	John W. Jenkins.....	Captain.
Nov. 30..	23d Sep. Co.....	3	William R. Elting.....	Captain.
Nov. 30..	9th Regiment....	1	William E. Cook	First Lieutenant.
Nov. 30..	11th Regiment ..	1	Albert E. Woolf.....	First Lieut. & Com. of Sub.
Nov. 30..	11th Regiment ..	1	Alfred E. Seliger.....	Second Lieutenant.
Nov. 30..	27th Sep. Co.....	3	William H. Plumb	Second Lieutenant.

RENDERED SUPERNUMERARY.

Captain Henry A. Menker, Inspector of Rifle Practice, Sixty-fifth Regiment (S. O. No. 97, c. s.)

II. The following company has been organized:

In the Third Brigade.

Forty-fourth Separate Company at Utica. Special Orders No. 82, dated September 13, 1887. Mustered into service September 27, 1887.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *December* 14, 1887.

GENERAL ORDERS, No. 35.

The following orders of the Commander-in-Chief are published for the information of all concerned:

In accordance with section one, chapter 247, Laws of 1887, a Bureau of Records of the War of the Rebellion is established in the office of the Adjutant-General. Colonel Frederick Phisterer and Mr. Gilbert C. Rice of the Adjutant-General's office, are assigned to the bureau, the former as its chief, the latter as his assistant. Until further orders the operations of the bureau will be confined to the work performed by the former volunteer division, and, as far as practicable, the perfecting of the records of the war on file in the office.

By order of the Commander-in-Chief.

JOSIAH PORTER.
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *December* 22, 1887.

GENERAL ORDERS, No. 36.

I. Commanding officers of regiments and battalions, and of batteries and separate companies having a medical officer, will organize ambulance corps in their respective commands as follows:

For a regiment or battalion, the corps shall consist of the medical officers of the command, the hospital steward, and three enlisted men from each company of seventy-five men, and two enlisted men from each company of less than that number.

For a battery or separate company, the corps shall consist of the medical officer and four enlisted men.

The enlisted men shall be detailed by the commanding officers upon the recommendation of their senior medical officers, and there may be included in the detail for a regiment or battalion two corporals, and for a battery or separate company one corporal but no other non-commissioned officers.

When the exigencies of the occasion require, commanding officers will detail such enlisted men as have already been found proficient, and may also detail musicians for duty with the corps.

Men detailed for ambulance service shall be relieved from such duty on the application of the medical officer having charge of the corps to which they are attached.

II. The corps shall be under the immediate orders, control and instruction of the senior medical officer of the command to which it belongs, but no assignment or detail for duty with the corps shall relieve an officer or enlisted man from his regular duties, except when on duty with the corps in active service.

III. To prepare the members of the corps for their duties, the medical officer in charge will provide a course of instruction. This course shall commence in the first week in January of each year and continue during the drill seasons of the year, and shall be open also to such other members of the command of which the corps is a part, as may be approved by its senior medical officer.

The dates, hours and places when and where the instruction will be given, shall be published in orders to the whole command by its commanding officer.

IV. The course of instruction given by the medical officers of the command shall include for the present:

Rudimentary instruction in anatomy and physiology.

Rudimentary instruction in the diagnosis of the common accidents and diseased conditions to which national guardsmen are exposed, and the common means for the prevention of the same.

Instruction as to the common means employed for the urgent relief of the sick and the injured, including stretcher-drill and matters pertaining to transportation of the sick and injured.

Instruction in individual and camp hygiene.

V. At the close of the course of instruction, the detailed men of the corps shall be examined as to their proficiency, by a board to be appointed for that purpose as hereinafter provided.

The senior medical officer of each regiment, battalion, battery and separate company shall keep a record of the name, proficiency and general standing of each member of the ambulance corps under his charge, from the time of the first attendance of the member to the termination of his course of instruction, and also the result of his examination.

VI. Commanding officers of brigades will, with the approval of the Surgeon-General, appoint for their respective commands, boards of examination which shall consists of not less than three medical officers, whose duty it shall be to examine and report to the brigade commader as to the proficiency of the detailed men who have attended the prescribed course of instruction. These men will be ordered before the

examining board on the application of the commanding officers of the regiment, battalion, battery or separate company to which they belong.

VII. Enlisted men of ambulance corps, when actually on duty as such, are authorized to wear, in addition to insignia of military grade, around the left arm above the elbow, an arm badge (brassard) "of white cloth, sixteen inches long and three wide, with a cross of red cloth two inches high and two inches wide in center."

VIII. An enlisted man who has passed the prescribed examination satisfactorily, and has the approval of the commanding officer of the brigade to which he belongs, will be permitted to wear at all times a badge of a pattern to be prescribed in further orders, distinctive of the ambulance corps of this State, as an indication of a special fitness to aid the sick and injured under urgent circumstances.

IX. Details for instruction in the duties of an ambulance corps will be made annually, at such time as will permit the course of instruction of each succeeding class to begin promptly in the first week in January.

X. There shall be allowed and issued by the Chief of Ordnance, as Acting Quartermaster-General, State arsenal, corner Thirty-fifth street and Seventh avenue, New York city, upon requisition made direct to him by the respective commanding officers, stretchers of a pattern approved by the Surgeon-General, at the rate of two for each regiment and battalion, and one for each battery or separate company having a medical officer.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

OPINION.

GENERAL HEADQUARTERS, STATE OF NEW YORK:

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *March* 12, 1887.

CIRCULAR, No. 1.

The following opinion of the Judge Advocate-General is published for the information of the National Guard:

STATE OF NEW YORK:

OFFICE OF THE JUDGE ADVOCATE-GENERAL,
STEWART BUILDING, 280 BROADWAY,
NEW YORK, *February* 16, 1887.

Major-General JOSIAH PORTER, *Adjutant-General State of New York:*

SIR.--I have the honor to acknowledge the receipt of a communication addressed to you under date of October 4, 1886, by Captain Welcome B. Randall, commanding the Forty-first Separate Company, stating the case of a company having by-laws that require applicants for enlistment to be voted upon and elected to membership prior to their enlistment by the commanding officer of the company; and inquiring whether the commanding officer has the legal power to enlist such applicants without such action by the company.

The provisions of the M. C. which directly refer to the enlistment of men into the National Guard are sections 40 and 42. Section 40 defines the persons who may be enlisted as "able-bodied men of good character who can read and write," regulates the term of enlistment and requires the consent of parents or guardians where the recruit is a minor.

Section 42 relates to the manner of the enlistment and the formalities attending it. It requires the signing of an enlistment paper, the taking of the oath of allegiance, and the approval of the paper by the commanding officer of the organization to which the troop, battery or company is attached. The form of the enlistment paper is to be prescribed by the Commander-in-Chief.

There is nothing in either of these sections which contemplates or requires an election of the would-be soldier to membership by the civil organization, as a prerequisite to his enlistment, and as these are two sections dealing with the formalities of enlistment, such a provision would naturally be found in them.

The civil organization is regulated by M. C. 139 and 140. There is no provision in either of these sections which in any way assumes to

regulate enlistments. The adoption of by-laws, rules and regulations is authorized, and it is provided that they shall conform to the system prescribed in the General Regulations, but it is also required that they must not be "inconsistent with this act." The question then fairly arises whether R. 147, which in terms requires the election of recruits by the civil organization before they can be enlisted, is a valid regulation.

The authority to issue regulations is found in M. C., 138, which authorizes the Commander-in-Chief to appoint a commission "to prepare such rules and regulations as may be deemed proper for the use, government and instruction of the military forces of the State, and to carry into full effect the provisions of this act." This grant of power is subject, however, to certain limitations implied in like cases, and growing out of the constitutional relation existing between the executive power vested in the Governor and the law-making power conferred on the Senate and Assembly. It is well settled that the Legislature cannot delegate the power to make laws to any other body or authority. (Cooley, Const. Law, 139.) Both branches of the government are vested with many subordinate and auxiliary powers, but neither can intrude upon or usurp the proper authority of the other. (Ex parte Mulligan, 4 Wall, U. S., 139.)

From these considerations result two rules, resort to which must be had in cases like the present. The first is, that regulations must not be contrary to the Constitution, nor to the statute under which they are made. (Winthrop's Dig., 116.) This rule is recognized by the Legislature in M. C., 147, which authorizes the making of regulations and expressly provides that they "shall conform to this act." The other is that regulations must be executive and not legislative in character. (2 Opin. Att'y-Gen'l, 220; 6 id., 10; 10 id., 31; McCall's Case, 5 Phila., 259; 1 Winthrop's M. L., 31.)

The raising, equipping and supplying of a military force, including naturally therein the power to determine who shall be enlisted, calls for the exercise of legislative powers. (Matter of Riley, 1 Benedict, 408; 6 Opin. Att'y Gen'l, U. S., 10.) These powers having been exercised by the Legislature in the form of statutory enactment, the duty of carrying them into effect is cast on the Governor, and that duty is strictly executive in character. To hold valid a regulation issued by him, which is contrary to the statute under which it is made, is to invest him with a legislative power superior to that possessed by the Senate and Assembly. A similar objectionable result is obtained by giving effect to a regulation which assumes to deal with a subject that can properly be controlled only by the exercise of legislative powers.

These questions were considered by the Hon. Caleb Cushing, when Attorney-General of the United States, in passing on a "system of Orders and Instructions for the Navy," which had been promulgated by the President. These he held of no effect in that they were not properly executive, but were legislative in character; and, as he pointedly expressed it, if the executive "may by a general order legislate on a military or a naval question, so may be on any other, and there is an end of all the barriers of the Constitution." (6 Opin. Att'y-Gen., 10.)

It has been pointed out that the intervention of the civil organization in the enlistment of recruits is not in terms authorized by any section of the Military Code. The Legislature has exercised its power and defined who may be recruited and also prescribed a system to be pursued in making enlistments.

Any regulation on the subject must conform to the provisions of the Military Code. Regulations, 147, prescribes a system for enlistment, differing in a material matter from that laid down by the Legislature. It calls for the approval of the enlistment by a body whose approval is not required by the act in question. The regulation does not conform to the statute in this behalf, but is contrary to its provisions. It is not executive, but if upheld would be legislative, and is inimical to the rules of construction to which attention has been directed.

A few words may well be said upon the operation of Regulation 147. By the terms of the preceding regulation each organization is permitted to adopt, subject to the approval of the Judge-Advocate, a system of by-laws for its government. These by-laws differ in many important requirements, and especially in so far as they pretend to regulate the enlistment of members. In some instances they are entirely silent upon this particular subject; in others they are flagrantly illegal. Naturally if each company has the right to make its own by-laws, with regard to matters so essentially important as that of enlistment, great irregularity and lack of uniformity in the system is to be expected, and while this is the case, I doubt if the worst anticipation would be as bad in these regards as the system which has actually grown up. For the purpose of discovering, if possible, what this system is, I have examined with care the by-laws of every company in the National Guard in this State, of which I have been able to get copies. Not only is it possible under the theory which has hitherto prevailed, for the system which applies in one regiment to be entirely unlike that which applies in another, but for the system applicable to two companies in the same regiment to be entirely

unlike. I am certain neither the law nor the law-makers ever contemplated such a possibility. The National Guard is something more and more serious than an aggregation of military clubs, over the control of which the club members themselves have absolute and final authority concerning admissions and expulsions. It is a well planned and thoroughly organized military body, designed for strictly military purposes, and intended to be the final police power of the State. It was the object of the law to breathe into this body as deep a spirit of military uniformity and duty as is compatible with the fundamental character of the citizen soldiery. If it is possible for each company to make its own requirements in these regards, then the State may be deprived of the very men whose service as soldiers would be of the utmost value. If the by-laws now prevailing in a majority of the companies are correct, the authority of the sworn officers of this service is nullified by the right of the civil organization to exclude from membership any person whomsoever on the score of his age, on the score of his looks, of his habits, manners, the company he keeps, and even on the score of his race. One company has already been mustered out of the service because of a race quarrel. The scarred but experienced veteran may be excluded on the ground that he is a German or a Hebrew, inasmuch as he associates habitually with Germans and Hebrews, which may not be satisfactory to the members of those companies which require that the associations of persons seeking admission to the service shall be satisfactory to the majority of the members. A person seeking to be recruited, who could be admitted into one company, would not be admitted into another by virtue of the difference in the number of black-balls required for exclusion, and so on *ad infinitum*. In order that these matters may be clearly shown, I will summarize the results of my examination of the by-laws in my possession.

Taking the regiments in the numerical order, I begin with the Seventh. I have examined the by-laws of Companies A, B, C, D, F, G, H and K of this regiment. All of these by-laws require a written application by the person seeking admission; some of them require in addition the name of the national guardsman who proposes him. His name is then required to be posted in three of the companies for one week, and in the rest of the companies for two weeks. Seven of the companies provide that such a person may be excluded from membership by five black balls, and one by three black balls. One of the companies also provides that a unanimous rejection by the committee is final; that the matter of the admission of the applicant so rejected by the committee, shall not even be presented to the company. The

majority of these companies require that the applicant must be five feet six inches in height. Company A requires in addition that he shall be of good moral character, good physical constitution and habits, and be examined by the regimental surgeon, and then assumes to repeal the statute by using the phrase providing for these qualifications, that they are "in addition to the qualifications required by law for enlistment in the National Guard." Company B requires not only that he shall be of good character, but be of gentlemanly manner and appearance. Company F requires that a person rejected can only be balloted for again after a month, and not more than twice, as do also Companies G and H. Company C requires that a person expelled shall be reëlected *de novo*, while company A requires that a person expelled is not eligible to reëlection. Company K requires that when the legal quota of membership is full, applicants may be balloted for and admitted to the civil organization as "members elect," who may be punished for violation of the by-laws and deprived of membership by a two-thirds vote of the members present.

The Eighth Regiment: Companies B, C, D, E, F, I and G, all provide that no person shall be eligible to election who has not been favorably reported upon by the committee. No qualifications for membership are prescribed by any of these companies. In Company D five black balls are required for rejection; in all the other companies three black balls. All of these companies but Company C provide for a system of court-martial, Company C having no such by-law, but requiring a two-third vote to expel.

The Ninth Regiment: Company B requires that the applicant for membership shall be proposed to the recruiting committee at least one week before election, and shall be balloted for by the company only on the favorable report of that committee. Company A requires that he shall be vouched for by the member proposing him as of good moral character, which is also the rule in companies B, G, H, I and K. Five negative votes are required to reject in all of these companies. The qualifications for membership, so far as prescribed by the by-laws in this regiment, are generally uniform. It is uniformly prescribed that a person shall not be eligible to reëlection if expelled. In Company B a person may be expelled from membership by a two-thirds vote of the members present. In the other companies a majority vote of all the members of the company is required in accordance with the M. C.

The Eleventh Regiment: Company A requires that the recruit shall be proposed by a member, may be enlisted by any commissioned officer, on satisfactory proof of good character and reputation; may

be rejected at the next meeting of the company by a two-thirds vote, or on the surgeon's report showing physical inability. It requires that he shall be an able-bodied man of good reputation, and five feet four inches in height.

Companies C, D, F, G, I and K have the same general requirements as Company A. Company B requires the recruit to be proposed in writing, to be vouched for by a member of the company, and to be elected not earlier than one week after the name has been referred to the committee ; five black balls will reject. Company H requires the candidate to have been posted for two weeks, and he is rejected if he receives less than a majority vote of those present at the company meeting. He is not required to be a citizen, but it is sufficient that he has declared his intention to become such. He is required to be of good moral character, manners and appearance, and must not be less than five feet five inches in height, although shorter men are acceptable to other companies. In Company H an expulsion is possible by a two-thirds vote of the members present, which is a flagrant violation of the statute which requires a majority vote of all the members of the company.

The Twelfth Regiment : I have been able only to examine the by-laws of Companies E and G. Company E prescribes that a candidate shall be proposed by a member, and that if he is favorably reported on he may be balloted for. Five black balls in either of these companies are sufficient to reject. Company E requires the candidate to be of good character and physical ability, while Company G requires that his qualifications shall be such as prescribed by the association of the board of officers.

The Thirteenth Regiment : Companies B, D, E, F, G, H, I and K require that the candidate must sign an application which must be indorsed by a member and posted one week. Companies B, G, I and K require five black balls to reject, while Companies D, E, F and H require but three. Company B requires that the candidate shall be in good health and physical condition ; of good character and habits, and with good associations and occupation, and able to speak, read and write English. Company D requires in addition to good character that the candidate shall have good manners, appearance and health, which is also required by Company E, which in addition requires correct habits and reputable associations and occupation, and that the candidate be five feet five inches in height. Company F is satisfied with the standard as prescribed by Companies D and E, in all regards, except the physical one, and a man who is five feet three inches is satisfactory to this company. Company G modestly only

requires good character and sound physical constitution. Company H requires a man of five feet five inches, who shall enjoy good health, be of good character, correct habits and "reputable associations and occupation." As to what may be regarded a reputable occupation by the members of a company one can only speculate, but such a by-law makes it possible to organize the company on the most thoroughly undemocratic basis. Company I requires that the candidate shall have a good constitution, and be "of good moral character and gentlemanly in behavior and appearance." I find no provision among the officers of the civil organization of this company for any officer to regulate the standard of gentlemanliness. In Company K the candidate must be a person liable to do military duty, must be in good health or physical condition, must be a resident or engaged in business in the State, not under five feet five inches, able to speak, read, write and comprehend the English language, be of good character and correct habits, and reputable associations and occupation.

The Fourteenth Regiment: I have only been able to examine the by-laws of Companies C, D, E and I. All require the posting of the name. Companies C and I require the favorable report of the committee and permit an exclusion by three black balls. Company E requires five black balls, and Company D none. Company C requires that he shall be able-bodied and a white male citizen, not under five feet four inches. Company I requires good character, sound physical condition, and eighteen years of age. Company E declares that those expelled from other organizations, or whose character is unsatisfactory, or who are not over five feet six inches, shall not be eligible. Company D prescribes no rules of eligibility in addition to those prescribed by the law. In Company I the rejected applicant may be proposed only on one month's notice, and not more than twice.

The Twenty-second Regiment: I have examined the by-laws of Companies B, C, D, E, F, G, H, I and K. Company B requires the recruiting committee to follow the rules of the board of officers; three black balls are sufficient to reject. Company C requires the candidate to be posted a week, and five black balls are enough to reject. The candidate must be a citizen of good character and constitution, and not less than five feet three inches in height. Companies E, F, G, H, I and K, make no specific provisions with regard to the manner of application, posting, etc., but in each of these companies three black balls will reject. In Company I an expelled member cannot be reëlected. Company D has copied its rule as regards requirements from Company K of the Thirteenth Regiment, except that the candidate is required to be only five feet four inches in height. In Company H a member may be expelled by a majority vote of those present.

The Twenty-third Regiment: Company A requires the candidate to sign the blank used by the company, which shall be indorsed by a member, and which shall be posted one week. On a favorable report of the committee the applicant may be balloted for and be black-balled by two votes. He is required to be a citizen, to reside in the State, to be of good character and sound physical condition, not under eighteen years old, five feet six inches in height, and possesses such other qualifications as the board of officers may prescribe. Company B is practically the same as Company A, except three black balls are required. Company C only requires two black balls; Company F three. Here, good character, gentlemanly manners and appearance, good health, and five feet six inches in height are required. Company I requires three black balls to reject. In Company H two black balls are sufficient. The candidate must not be less than eighteen years of age, five feet five inches in height, of good moral character and good health. This company is incorporated regularly under the Club act of 1875. Company D, where two black balls may reject, requires good appearance, health, manners and character, and five feet six inches.

The Forty-seventh Regiment: Company A requires a favorable report of the committee, posting for two weeks, three black balls; and while it prescribes no particular qualifications, has a clearly illegal provision in that of expulsion by vote of a majority of the members present. Company B has but few provisions with regard to membership, simply requiring that the committee shall report to the commissioned officer, which is also true of Company E, where the candidate is required to have a good character for morality and gentlemanly conduct. Company G requires written application indorsed by a member, and to be posted two weeks. A vote of two-thirds of the members present is required to elect. This company also recognizes the illegality of its own act in the following terms, by requiring that "in addition to the qualifications required by law," the candidate must be five feet six inches in height, of good moral character and sound physical constitution. A member may be expelled by a two-thirds vote of those present. Company I requires five black balls; Company K requires three. Company I requires the candidate to be of good health, character, manners and appearance, and five feet five inches. Nothing is said about citizenship. Company K requires him to be a citizen, five feet six inches in height, of good character, sound health, and of ability to perform the duties.

The Sixty-ninth Regiment: This regiment leaves the whole matter with the committee. Company C requires the candidate to be posted a week, and exacts the same requirements as Company F. Company

D prescribes practically the same things as Company C, except that three votes are sufficient to reject. Company K also rejects by three votes; requires the applicant to be of good moral character, at least eighteen years of age and a citizen, and permits an expulsion by a majority vote, three-fifths of the members being present. Company F seems to have borrowed one of its by-laws from the Thirteenth and Fourteenth Regiments, or to have loaned its by-laws to two companies in this regiment, for in practically the same terms it requires a candidate to be of good health and physical condition, resident or engaged in business in this State, not under five feet five inches in height, speaking, reading, writing and comprehending the English language, of good character, good habits, and of reputable associations and occupations. Company E requires a majority vote to reject the candidate.

The Seventy-first Regiment: Company H requires two black balls. Companies A, C and K require three black balls. Companies D and G require five. Company C requires a favorably report of the committee before the candidate can be presented to the company. Provisions vary as to posting, etc. Company A seeks only able-bodied men of good character. It provides that an expelled member is not eligible to reëlection. Company C requires good character, good health, citizenship, and a height of five feet four inches. Company D excludes all but able-bodied white male citizens, or those who have declared their intention to become citizens. Not satisfied with this exclusiveness, this company requires that even the white shall be of good personal appearance. Company H, in addition to good appearance, requires gentlemanly manners and good health. Company I has observed the law by imposing no conditions other than that the applicant shall be an able-bodied man of good character who can read and write. This company, however, requires the action of two-thirds of the whole company to authorize an expulsion. Company K requires good character, manners and appearance, and five feet six inches in height, and permits expulsion by two-thirds of the members present at the meeting. A rejected candidate is not eligible for election until after the expiration of a year.

Company C of the Seventy-fourth Regiment requires three black balls to exclude, and permits the expulsion of a member by a two-thirds vote of the members present.

In the Artillery, the First and Third Batteries require three black balls to reject; in the Fifth, a majority of the members present are required to elect; in the Fourth, the application of a candidate is to go to a committee and lie over one week; in the Fifth and Sixth, the battery can only vote on a candidate after favorable report by the committee, but in the Sixth, five black balls reject the candidate, and

if the nominee appears to be "maliciously" rejected, the captain may call for the reasons of the persons voting against him, and if they are insufficient, in his opinion, a second ballot may be had, upon which a majority vote determines the question. In the Second Battery, the candidate is required to be of gentlemanly manners and appearance. In the Third Battery the applicant must be a citizen of good moral character and sound constitution, and five feet four inches in height; a member may be expelled by a two-thirds vote of those present. In the artillery branch of the service the qualifications for membership are generally the same and generally legal.

Company A, Tenth Battalion, has prescribed that the applicant shall apply in writing, that his nomination shall only be acted upon after recommendation by the committee; that then five black balls shall be sufficient to reject him, and that a member may be expelled by a majority vote of those present.

I have examined carefully the by-laws of Separate Companies 1st, 2d, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 11th, 12th, 14th, 15th, 16th, 17th, 20th, 22d, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32d, 34th, 35th, 36th, 37th, 38th, 40th and 41st.

The same lack of uniformity and system prevails here as elsewhere. Of these companies the majority require written application, posting for various lengths of time, favorable report of the committee on membership, etc. One of them, the 8th, requires but two black balls to reject. Three, the 15th, 40th and 41st, require three black balls to reject; one requires four black balls to reject; nineteen require five black balls to reject; one requires six black balls to reject, being the Fenton Guards, and one requires eight black balls to reject. The 34th requires ten black balls to reject. The requirements with regard to height vary from five feet four inches, to five feet six inches as a minimum. Some of the companies, as the 7th, require good character, manners and appearance. The 8th refines somewhat with regard to the question of manners, and requires that the manners be not only good but gentlemanly. The 20th also requires good manners and residence in Binghamton. The 25th calls for gentlemanly appearance, likewise the 29th and 30th. The 31st repeats the qualification of good manners and appearance, while the 32d requires correct habits and deportment, as does also the 35th. In a number of these companies the law is flagrantly violated with regard to the matter of expulsion. In the 3d and 31st, a member may be expelled by a majority vote of those present; in the 29th by a three-fifths vote of two-thirds of the company. One of these companies requires a rejected applicant to wait three months before application the second time; two of them require him to wait sixty days.

This presents a state of affairs which could never have been foreseen by the Legislature, and which certainly was never designed, and is not permissible by the law. The entire system has grown out of the fact that the service has been led to believe it to be legal and allowable, in view of the provisions of the general regulations upon the subject of company by-laws. The evil lies in the fact that this general regulation is itself patently illegal, as being in conflict with the provisions of the statute. I have thus gone into the matter in detail for the purpose of illustrating the outgrowth of the regulation, the legality of which I have discussed earlier in this opinion.

I have examined all of the by-laws presented to me under Special Order 97, series of 1886, and have not found a single instance in which the qualifications for membership and the system of enlistment by the civil organization in any regiment, is exactly the same in all of its companies; and but one instance in which the qualifications and procedure are substantially the same. This statement will serve to emphasize my remark made earlier in this opinion, that there is not only a diversity in procedure between the various regiments, but the utmost difference among the companies composing each regiment. This condition of things is the outcome of the present system by which the civil organization assumes, in my opinion quite unlawfully, to regulate the enlistments into the National Guard. It is not to be expected that these differences will decrease, but rather that they will increase with the lapse of time. Nothing could present a stronger contrast to this general lack of system than the simplicity and uniformity in the manner of enlistment called for by section 42 of the Military Code. The Military Code recognizes the existence of the civil organizations, but, as I have already said in my former opinion, there is nothing in the present law which makes such civil associations the foundation and centre of the entire service, by giving them an unlimited and final control in the matter of enlistment. This question of recruiting and enlistment lies at the very foundation of the service, and, if the present system could be upheld, the State might be deprived of the service of its best and most available men, because of the predominence of the spirit of exclusiveness, or for any other reason which might prevail to lead companies to enact into their by-laws requirements which are out of place in any democratic system of goverment and in any true military service.

It is also to be observed that the conclusion which I have reached in reference to the legality of R. 147, does not leave the system of enlistment devoid of a proper and competent authority to determine the suitableness of the recruits. In addition to the general obliga-

tion cast on all officers who are directly connected with the matter of enlistment, it is expressly provided by the last sentence of M. C. 42, that "no person shall be considered as enlisted in the National Guard until his enlistment paper has been approved by the commanding officer of the organization to which the troop, battery or company is attached." The approval cast upon such officer is plainly not of a perfunctory character. With him resides the power to determine whether the recruit shall be enlisted, and with his assent all previous proceedings become final. In the discharge of the duty of examining and approving applications for enlistment, such commanding officer is plainly required to satisfy himself that the recruits are "able-bodied men of good character, who can read and write." He may well require their physical condition to be certified to him by a regimental surgeon, and their good character to be vouched for by persons of known standing, and their capacity to read and write to be made manifest by examination or proper certification. In a word, he may require any legal and proper evidence that the recruit possesses the qualifications required by M. C. 40. Indeed, the action contemplated by the words just quoted from M. C. 42 cannot be advisedly taken without the possession of some evidence that the recruit is up to the requirements of section 40.

In conclusion, I would invite attention to the fact that the present condition of the by-laws of the various military organizations is such that action is needed to do away with illegal provisions, to some of which I have called attention, and to conform such by-laws to the plain provisions of the Code.

I have the honor to advise that upon the case submitted, as stated by me at the commencement of this opinion, the commanding officer of a separate company has the legal power to enlist would-be recruits, subject to the approval of his commanding officer, under M. C. 42, and this, although such company has a civil organization and by-laws requiring aplicants for enlistment to be voted for and elected to its membership prior to their enlistment by the commanding officer. This conclusion necessarily involves the illegality of R. 147, in so far as it seeks to make election to membership in the civil organization a prerequisite to membership in the National Guard.

I have the honor to remain, very respectfully yours.

WM. M. IVINS,
Brigadier-General and Judge Advocate-General.

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

GENERAL HEADQUARTERS, STATE OF NEW YORK :

ADJUTANT-GENERAL'S OFFICE,
ALBANY, *March* 31, 1887.

CIRCULAR, No. 2.

It appearing that the description books issued do not contain space for all the information required to be noted therein, the following corrections should be made:

"Page of enlisted men, *when* record is noted," should read "Page of enlisted men, *where* record is noted."

Before "date of enlistment" insert a column (taking space from column "grade") parallel to it, and of the width of the column "day," for "*Age*," "*years.*"

After the column "squad number" insert a column (taking space from column "address of residence") parallel to it, and of same width, for "*Period of service, years.*"

To the heading "address of place of business" add "*nature of occupation.*"

The next column "Previous service" may be made to read "*Place of birth and* previous service," if it be desired to place this on record.

Resumé of *previous* service and remarks," should read "Resumé of *present* service and remarks (R. 574).

By order of the Commander-in-Chief.

JOSIAH PORTER,
Major-General and Adjutant-General.

CORRECTED FORM.

NAMES.	Grade.	AGE.	DATE OF ENLISTMENT.			Company number.	Squad number.	PERIOD OF SERVICE.	Address of residence.	Address of place of business and nature of occupation.	Place of birth, and previous service.	Resumé of present service and remarks.
		Years.	Days.	Months.	Years.			Years.				

(D.)

REPORT OF THE INSPECTOR-GENERAL, 1887.

STATE OF NEW YORK:

INSPECTOR-GENERAL'S DEPARMMENT,
ALBANY, *December* 18, 1887.

The Adjutant-General, S. N. Y., Albany:

SIR.—In compliance with the requirements of M. C. 20 and R. 589, I have the honor to submit my annual report.

Accompanying this I transmit reports of Col. Thomas H. McGrath, Assistant Inspector-General, which officer, assisted by Lieut.-Col. F. C. McLewee, Assistant Inspector-General, has inspected and mustered the entire force of the State, pursuant to General Orders Nos. 12, 19, 24 and 29, current series, General Headquarters, S. N. Y., and dated respectively April 15, May 12, July 28 and September 13, 1887.

The result of the muster shows the aggregate strength of the National Guard to be 12,496, subdivided as follows:

General and staff officers (not mustered)	49
Artillery	414
Infantry	12,014
Signal Corps	19
Total	12,496
Aggregate strength at muster of 1886 was	12,425

The reports of my assistants on the condition of the Guard, written and verbal, are highly gratifying, and I do not hesitate to say that the general improvement in the National Guard has been greater during the past year than in any year of its history.

It seems as if all had grown to realize the fact that they are not independent organizations, but part of a force dependent on and amenable to the laws of the State and subordinate to its regulation and discipline.

I consider this a most happy condition of affairs and an enormous stride toward thorough efficiency.

The muster of 1887 shows the total number present to be 10,444. I do not consider this a fair indication of the effective or reliable strength of many of the organizations.

I think too much stress is given to the fact that it is important to parade larger percentages at inspection than on any other occasion during the year, and the time consumed in visiting men and employers is so often overdone that more important details are neglected.

An enlisted man who has not pride enough in himself or his company to parade on every occasion of duty when possible is of very little value to the State or the organizations.

This visiting and coaxing process just before inspection should cease as subversive of discipline.

Another evil to be noticed in this connection (not that it is practiced to any large extent, but sufficient to note and deprecate) is that names of men who are absent from the locality, or of whom it is positively known that they will not be present, are dropped just preceding and taken up at a convenient time after inspection.

This shows a better percentage of attendance, but is not in conformity with the spirit of the Code, and should be discontinued.

The inspecting officers have been very particular this year to call special attention to any deficiency in cleanliness or neatness of dress and want of propriety in adjustment of accoutrements, for although there may possibly be excuses for other deficiencies in a military organization, there is certainly no excuse whatever for a lack of cleanliness, neatness or proper wearing of accoutrements.

That this condition exists to any extent, is only the fault of company commanders.

A man should not be allowed to remain in the ranks, for company drill, who does not present himself neatly and properly dressed, and if on every occasion such an one were directed to leave the ranks and prepare himself properly, the result would be of immense benefit.

Non-commissioned officers particularly should be models in this respect; clean belts, spotless brasses, polished shoes, uniforms neat and well fitted, hair properly cut, and dignified bearing, should mark him as an example.

It is intended during the coming year to report severely on any organization lacking these requirements.

DISCIPLINE.

That discipline, as compared with last year, shows marked improvement, is a fact. It is, nevertheless, apparent that it has not obtained that high standard which it should and can.

Military courtesy and discipline are allied, for where the former is ignored the latter is seldom found.

Show me a company where the enlisted men are respectful and courteous to its commissioned officers, and invariably that company will appear for duty giving evidence of excellent discipline. The contrary is quite as noticeable. The freedom of intercourse which exists too often between officers and enlisted men should cease.

The officer who does not, or cannot command respect, should resign, for if he fails in this important feature, his sphere of usefulness is so limited as to render him of little value to the service. The fault in this, as in all other cases, is entirely with the officer.

SEPARATE COMPANIES.

In my report for 1886, I suggested that an officer be detailed to make at least semi-annual visits to all separate companies, to point out existing errors and be prepared to answer all questions appertaining to military training, drill and discipline. I now earnestly reiterate this recommendation. The necessity which then existed applies quite as forcibly now, and the suggestion has been hailed by a large majority of commanding officers, and any officer detailed will, I am sure, receive from them a hearty welcome.

INSPECTION OF COMPANIES OF REGIMENTS.

An inspection of companies of regiments particularly as regards drill and ability of officers has been inaugurated for the information of this department, and under your orders drills of the companies of the Sixty-fifth and Seventy-fourth regiments have been held, and Lieut.-Col. F. C. McLewee is now attending those which have been ordered for the Ninth and Eleventh regiments.

If the inspecting officers are received with that courtesy and enthusiasm which marked their attendance at Buffalo by all the officers except one, this new feature of inspections will prove a great success and work vast benefit.

UNIFORMS.

In regard to uniforms there is nothing that, in my opinion, can be added to or taken from the comments and suggestions made in my last annual report.

The blouse is unquestionably the garment, and sooner or later it will be the service coat for the National Guard. Why not commence its issue at once?

BOOKS AND RECORDS.

The keeping of books and records is decidedly not uniform. In some organizations neatness and proper methods prevail; in others they are so wretchedly incorrect as to be of no value to the State.

In some cases the books have been so destroyed by improper entries as to make it impossible for them to be set right. In these cases, the only remedy will be to issue new books.

RETAINED RANK.

There are instances where officers who have been long out of active service and carried as supernumeraries, have been elected to positions entitling them to commissions of the same grade as those under which they were rendered supernumerary. When newly commissioned, they have been given rank from date of original commission. I do not think this just to an officer who has worked faithfully, and to whom priority of rank, which confers certain honors and privileges, is esteemed not only for its prerogatives, but as the evidence of length of active service.

I respectfully and firmly recommend that the matter be brought to the attention of the Legislature, and that an amendment to the Code be secured if possible, so that this impropriety may be done away with.

Your attention is particularly invited to the reports of the Assistant Inspector-Generals on the condition of the various organizations of the guard.

Confirming their reports, I would respectfully recommend that for the good of the service the following organizations be disbanded:

* * * * * * * * * * * *

I deem it a duty to again call attention to the fact that I consider the great obstacle to more rapid advance and proficiency, is the positive incompetency and inefficiency of company officers. Very much more care should be taken by examining boards, and all questions of friendship or accommodation should be positively eliminated in considering the qualifications of an officer. Examinations should cover a broader ground than tactics, and an officer should be questioned on his ideas of discipline, knowledge of keeping official records, and his views on what he considers personal neatness and propriety of a soldier. Finally, he should be judged as much by his demeanor and personal bearing at the examination, as by his perfection of knowledge in tactics.

We must have competent and intelligent officers or the system fails.

In conclusion, I desire to express my acknowledgments to Colonel Thomas H. McGrath, and Lieutenant-Colonel F. C. McLewee, of this Department, for the valuable assistance rendered by them during the past year. I am greatly indebted to them both for their able and constant devotion shown in the discharge of the many duties assigned to them, and the satisfactory and thorough execution of the same.

I have the honor to be, General,

Very respectfully your obedient servant,

EMIL SCHAEFER,

Inspector-General.

STATE OF NEW YORK :

INSPECTOR-GENERAL'S OFFICE,
ALBANY, *December* 18, 1887.

The Inspector-General, S. N. Y., New York City:

SIR.—I have the honor to report that in compliance with General Orders Nos. 12, 19, 24 and 29, current series, General Headquarters, State of New York, and dated respectively April 15, May 12, July 28 and September 13, 1887, I have inspected and mustered the several organizations of the National Guard named therein, and respectfully submit as a result the following report :

SEVENTH REGIMENT, NEW YORK CITY.

Inspected November 22, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted Men.	Total.	Officers.	Enlisted Men.	Total.	
Field and staff	10	.....	10	.....	.....	....	10
Non-commissioned staff	.....	11	11	.....	.....	....	11
Company A	3	98	101	.....	2	2	103
Company B	3	100	103	.....	.....	....	103
Company C	3	96	99	.....	4	4	103
Company D	3	87	90	.....	5	5	95
Company E	3	91	94	.....	2	2	96
Company F	3	100	103	.....	.....	....	103
Company G	3	100	103	.....	.....	....	103
Company H	3	98	101	.....	2	2	103
Company I	3	100	103	.....	.....	....	103
Company K	3	97	100	.....	3	3	103
Total	40	978	1,018	.....	18	18	1,036

Percentage present, 98.26

A truly magnificent inspection not only in the wonderful and unprecedented percentage present, but in the combination of detail that contributes to make a perfect organization.

While *possible*, it is hardly probable that this will ever be excelled. In *any* event the inspection of 1887 will be handed down in the history of the regiment as one of, if not *the* grandest on record.

EIGHTH REGIMENT, NEW YORK CITY.

Inspected October 25, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted Men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	8	.....	8	2	.....	2	10
Non-commissioned staff	.....	9	9	.....	2	2	11
Company B	2	29	31	.....	9	9	40
Company C	2	29	31	1	6	7	38
Company D	2	47	49	.....	27	27	76
Company E	2	41	43	1	8	9	52
Company F	.....	20	20	.....	37	37	57
Company G	1	35	36	.....	10	10	46
Company H	.....	37	37	.....	14	14	51
Company I	3	39	42	.....	6	6	48
Total	20	286	306	4	119	123	429

Percentage present, 71.32.

While the Eighth regiment is not yet by any means to be highly rated, it is a pleasure to the inspecting officer to be able to note and report a very perceptible and gratifying progress in every way at this inspection, as compared with 1886. The improvement in general appearance is vast, and while it will possibly take years, if the advance made during 1887 continues the regiment will again resume its past high standard. Companies B, C, G and I are below the minimum.

NINTH REGIMENT, NEW YORK CITY.

Inspected October 26, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	9	.....	9	1	.....	1	10
Non-commissioned staff	.....	11	11	.....	.....	....	11
Company A	2	52	54	.....	4	4	58
Company B	.....	26	26	2	22	24	50
Company C	1	33	34	.....	19	19	53
Company D	1	36	37	1	9	10	47
Company E	2	29	31	.....	18	18	49
Company F	3	51	54	.....	14	14	68
Company G	2	37	39	.....	11	11	50
Company H	2	40	42	1	12	13	55
Company I	3	29	32	.....	24	24	56
Company K	2	28	30	.....	24	24	54
Total	27	372	399	5	157	162	561

Percentage present, 71.12.

While some of the companies show an improvement in appearance and discipline, the regiment as a whole has retrograded during the past year.

Poor discipline prevails, as was evidenced by the unsteadiness and unrebuked talking in several of the companies.

Camp reports show that the practical work of the regiment on entry into camp was poor, and that no improvement was made during the week.

The fault does not seem to be with the enlisted men, who are able and willing, but with the administration.

The methods and views entertained are such as will never make an efficient organization.

In its present condition it is not reliable, and unless a change is made it would be wise economy to disband the regiment. Companies D and E are below the minimum.

TENTH BATTALION, ALBANY.

Inspected September 30, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	3	.....	3	2	.....	2	5
Non-commissioned staff	.....	7	7	.....	4	4	11
Company A	3	53	56	.....	11	11	67
Company B	2	49	51	.....	9	9	60
Company C	3	42	45	.....	12	12	57
Company D	2	41	43	1	11	12	55
Total	13	192	205	3	47	50	255

Percentage present, 80.39.

The general appearance of the battalion was an improvement as compared with last inspection, for which company commanders are entitled to credit. The formation of the battalion for review and inspection was done in a haphazard, unmilitary manner. The reports of the work done in camp are very unsatisfactory. * * * *

ELEVENTH REGIMENT, NEW YORK CITY.

Inspected October 19, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	8	.....	8	1	.....	1	9
Non-commissioned staff	.....	8	8	.....	1	1	9
Company A	1	64	65	.....	29	29	94
Company B	2	48	50	.....	19	19	69
Company C	2	39	41	.....	.....	....	41
Company D	2	49	51	.....	18	18	69
Company F	2	29	31	.....	22	22	53
Company G	1	26	27	.....	14	14	41
Company H	3	28	31	.....	17	17	48
Company I	1	36	37	.....	20	20	57
Company K	2	39	41	1	9	10	51
	24	366	390	2	149	151	541

Percentage present, 72.08.

It is gratifying to note the progress in any organization. In the case of the Eleventh Regiment, while this progress has not been as great as could have been wished, it is nevertheless marked, and all concerned should feel sufficiently encouraged to go on with the good work. The attention of the commanding officer is particularly called to the very bad condition of the arms, which is such as to reflect no credit on the armorer.

Companies C, G and H are below the minimum.

TWELFTH REGIMENT, NEW YORK CITY.

Inspected October 24, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	9	.....	9	1	.....	1	10
Non-commissioned staff	.....	9	9	.....	1	1	10
Company A	3	51	54	.....	19	19	73
Company B	2	46	48	1	4	5	53
Company C	2	43	45	.....	25	25	70
Company D	2	81	83	1	15	16	99
Company E	3	42	45	.....	9	9	54
Company F	3	51	54	.....	15	15	69
Company G	2	61	63	.....	5	5	68
Company H	3	61	64	.....	15	15	79
Company I	2	36	38	.....	16	16	54
Company K	2	26	28	.....	9	9	37
Total	33	507	540	3	133	136	676

Percentage present, 79.88.

The general neatness of dress, proper adjustment of equipments and discipline of the Twelfth, at this inspection, were in happy contrast with that of 1886. The improvement is marked and must be a source of gratification to the regiment, as it is to the inspecting officer so to be able to note.

The ceremony of review was ragged and unmilitary. * * *

The formation for inspection in close column of companies was a gross violation of the tactics, and unnecessary.

Company K is below the minimum.

THIRTEENTH REGIMENT, BROOKLYN.

Inspected September 3, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	6	.....	6	1	.....	1	7
Non-commissioned staff	.....	10	10	.....	1	1	11
Company A	3	32	35	.....	15	15	50
Company B	3	37	40	.....	6	6	46
Company C	3	45	48	.....	9	9	57
Company D	2	42	44	.....	.....	....	44
Company E	2	33	35	.....	17	17	52
Company F	3	31	34	.....	14	14	48
Company G	2	60	62	.....	12	12	74
Company H	1	47	48	.....	2	2	50
Company I	1	35	36	1	6	7	43
Company K	1	45	46	.....	4	4	50
Total	27	417	444	2	86	88	532

Percentage present, 83.45.

General appearance of the regiment was very good, and except the poor manner in which overcoats were rolled, might have been classed as excellent; the ceremony of review was correct in detail and very handsomely rendered; men perfectly steady in line, and the passage by companies most creditable. The drill prior to inspection occupied about one hour and three-quarters of time. With few exceptions, all movements were promptly and accurately performed, the absolute correctness of guides and thorough knowledge of their duties being worthy of special mention. The result of the inspection is most gratifying and reflects credit on both officers and enlisted men. Only two commissioned officers were absent, the colonel and commanding officer of Company I, both without leave. Colors worn and unserviceable.

The following companies are below the minimum: B, D, F and I.

FOURTEENTH REGIMENT, BROOKLYN.

Inspected November 21, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	10	.....	10	.....	.....	....	10
Non-commissioned staff	.....	11	11	.....	.....	....	11
Company A	2	41	43	.....	7	7	50
Company B	1	36	37	1	11	12	49
Company C	2	31	33	.....	12	12	45
Company D	1	36	37	.....	13	13	50
Company E	3	50	53	.....	7	7	60
Company F	2	48	50	.....	.....	....	50
Company G	1	33	34	.....	22	22	56
Company H	2	34	36	.....	13	13	49
Company I	2	39	41	.....	4	4	45
Company K	3	40	43	.....	7	7	50
Total	29	399	428	1	96	97	525

Percentage present, 81.52.

While the general appearance of the Fourteenth shows improvement, there yet are noted deficiencies which should not exist.

Company commanders must exercise more vigilance. The fault is entirely with them. With proper supervision on their part the regiment will appear equal to any in the State.

Companies B, C, H and I are below the minimum.

TWENTY-SECOND REGIMENT, NEW YORK.

Inspected November 2, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	11	.....	11	.....	.....	....	11
Non-commissioned staff	.....	10	10	1	.....	1	11
Company A	3	48	51	.....	2	2	53
Company B	3	73	76	.....	8	8	84
Company C	3	35	38	.....	5	5	43
Company D	2	39	41	1	4	5	46
Company E	3	74	77	.....	13	13	90
Company F	3	32	35	.....	3	3	38
Company G	3	35	38	.....	7	7	45
Company H	2	61	63	1	8	9	72
Company I	3	46	49	.....	4	4	53
Company K	3	39	42	.....	5	5	47
Total	39	492	531	3	59	62	593

Percentage present, 89.54.

While the few defects or deficiencies noted on some of the company rolls should not have existed, it is nevertheless a fact that the inspection of this regiment was a grand showing.

The ceremony of review and subsequent inspection and muster made evident the fact that the Twenty-second is an organization

thoroughly reliable, well disciplined, and of which the State should be proud.

Companies C, D, F, G and K are below the minimum.

TWENTY-THIRD REGIMENT, BROOKLYN.

Inspected October 10, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	7	.....	7	1	.....	1	8
Non-commissioned staff	.....	10	10	.....	1	1	11
Company A	3	78	81	.....	3	3	84
Company B	3	59	62	.....	.....	....	62
Company C	3	56	59	.....	1	1	60
Company D	3	53	56	.....	2	2	58
Company E	3	56	59	.....	.....	....	59
Company F	3	65	68	.....	1	1	69
Company G	3	60	63	.....	3	3	66
Company H	3	59	62	.....	1	1	63
Company I	3	68	71	.....	.....	....	71
Company K	3	67	70	.....	5	5	75
Total	37	631	668	1	17	18	686

Percentage present, 97.37.

The general appearance of the regiment at this inspection did not compare favorably with that of last year. In several companies that exact care in preparation that has marked the inspection of the Twenty-third for the past few years was not apparent.

It would seem that the endeavor to parade a large percentage was the most prominent part of the work of preparation. This should not be. The efficiency of an organization is not judged by the percentage present at an inspection, but by what it parades on other important occasions of duty, and the Twenty-third is judged more on its fifty-seven per cent at camp and sixty per cent at brigade field day than the $97\frac{37}{100}$ per cent at inspection.

THIRTY-SECOND REGIMENT, BROOKLYN.

Inspected October 12, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	9	.....	9	.....	.....	....	9
Non-commissioned staff	.....	10	10	.....	.....	....	10
Company A	3	29	32	.....	8	8	40
Company B	2	33	35	.....	13	13	48
Company C	3	27	30	.....	16	16	46
Company D	1	45	46	.....	12	12	58
Company F	2	30	32	.....	5	5	37
Company G	2	31	33	.....	8	8	41
Company H	2	34	36	1	25	26	62
Company I	1	17	18	.....	13	13	31
Company K	1	20	21	.....	15	15	36
Total	26	276	302	1	115	116	418

Percentage present, 72.24.

No improvement can be noted in the condition of this regiment. The whole condition of affairs can only be charged to company officers, and unless they can give better evidence of merit than has appeared during the past two years a change would be recommended.

Companies A, B, C, F, G, I and K are below the minimum.

FORTY-SEVENTH REGIMENT, BROOKLYN.

Inspected October 18, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	8	.....	9	1	.....	1	10
Non-commissioned staff	.....	9	9	.....	1	1	10
Company A	1	30	31	.....	6	6	37
Company B	3	34	37	.....	6	6	43
Company D	3	46	49	.....	8	8	57
Company E	2	33	35	.....	5	5	40
Company F	1	53	54	....	8	3	57
Company G	2	62	64	.....	5	5	69
Company I	3	59	62	.....	6	6	68
Company K	3	59	62	.....	2	2	64
Total	27	385	412	1	42	43	455

Percentage present, 90.54.

It is a pleasure to note a decided improvement in the general appearance and discipline of the regiment.

Company officers have yet much work to do in order that the regiment attain a higher standard.

Companies A, B and E are below the minimum.

SIXTY-FIFTH REGIMENT, BUFFALO.

Inspected May 26, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	8	.....	10	.....	.....	....	10
Non-commissioned staff	.....	9	9	.....	.....	....	9
Company A	1	36	37	1	7	8	45
Company B	2	47	49	.....	13	13	62
Company C	2	40	42	.....	11	11	53
Company D	3	43	46	.....	10	10	56
Company F	3	46	49	.....	2	2	51
Company G	3	24	27	.....	23	23	50
Company H	3	43	46	.....	10	10	56
Company I	2	43	45	.....	9	9	54
Total	29	331	360	1	85	86	446

Percentage present, 80.71.

The efforts of the lieutenant-colonel commanding, ably assisted by the major, to bring the organization from an almost demoralized condition, particularly as regards neatness and general appearance, has been thoroughly successful. The improvement noted is vast and reflects great credit on all concerned.

The following named company is below the minimum: Company A.

SIXTY-NINTH REGIMENT, NEW YORK CITY.

Inspected October 20, 1887.

	PRESENT.			ABSENT.			Aggregate
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	8	.....	8	2	.....	2	10
Non-commissioned staff	.....	7	7	.....	4	4	11
Company A	2	52	54	.....	22	22	76
Company B	3	59	62	.....	20	20	82
Company C	3	73	76	.....	13	13	89
Company D	3	73	76	.....	17	17	95
Company E	3	73	76	.....	27	27	103
Company F	3	74	77	.....	19	19	96
Company G	3	72	75	.....	5	5	80
Company H	2	81	83	.....	19	19	102
Company I	3	57	60	.....	22	22	82
Company K	3	57	60	.....	25	25	85
Total	36	678	714	2	193	195	909

Percentage present, 78.54.

The ceremony of review preceding the inspection was rendered in a manner which reflects great credit on the organization.

The general appearance and discipline of the regiment is an improvement as compared with last year. Companies A, E, H and K only seem to have made no progress; otherwise the Sixty-ninth is in a healthy condition, efficient and reliable.

SEVENTY-FIRST REGIMENT, NEW YORK CITY.
Inspected October 21, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	9	.....	9	.....	.....	....	9
Non-commissioned staff	.....	9	9	.....	2	2	11
Company A	3	51	54	.....	3	3	57
Company B	2	36	38	.....	3	3	41
Company C	2	37	39	.....	5	5	44
Company D	3	72	75	.....	16	16	91
Company F	3	40	43	.....	8	8	51
Company G	2	32	34	.....	16	16	50
Company H	2	53	55	.....	16	16	71
Company I	2	56	58	1	16	17	75
Company K	3	58	61	.....	5	5	66
Total	31	444	475	1	90	91	566

Percentage present, 83.92.

The inspection developed a gratifying progress in the affairs of the Seventy-first, which reflects credit on all concerned. Companies D, F and G seem, as far as appearance and discipline are concerned, to be a drag on the regiment. The officers of these companies must look to themselves and not stand in the way of advance of the regiment. As an organization the Seventy-first is to be congratulated for the good work done.

Companies B and C are below the minimum.

SEVENTY-FOURTH REGIMENT, BUFFALO.
Inspected May 25, 1887.

	PRESENT.			ABSENT.			Aggregate.
	Officers.	Enlisted men.	Total.	Officers.	Enlisted men.	Total.	
Field and staff	10	.....	10	.....	.....	....	10
Non-commissioned staff	.....	9	9	.....	.....	....	9
Company A	2	45	47	.....	6	6	53
Company B	3	49	52	.....	1	1	53
Company C	3	38	41	.....	4	4	45
Company D	3	37	40	.....	4	4	44
Company E	3	46	49	.....	.....	....	49
Company F	3	42	45	.....	.....	....	45
Company G	3	39	42	.....	3	3	45
Total	30	305	335	.....	18	18	353

Percentage present, 94.90.

The inspection of the regiment revealed an improvement in all respects as compared with 1886. Military appearance very good. Men steady in line. Companies A and E being exceptionally poor. National color unserviceable. Colonel wearing service chevrons. The following companies are below the minimum. Companies C, D, E, F and G.

FIRST SEPARATE COMPANY, PENN YAN.

Inspected May 31, 1887.

	Present.	Absent.	Aggregate.
Officers	3	1	.....
Enlisted men	42	7	.....
Total	45	8	53

Percentage present, 84.90.

A very good company; all its officers above the average, handling themselves and the company ably, discipline excellent, men very attentive, drill very good, movements in company and platoons well understood. The armory is entirely inadequate and unfit for the purposes for which it is used. It is a disgrace to the county that so good an organization should be so poorly housed.

SECOND SEPARATE COMPANY, AUBURN.

Inspected August 23, 1887.

	Present.	Absent.	Aggregate.
Officers	4	.....	.....
Enlisted men	61	13	.....
Total	65	13	78

Percentage present, 83.33.

The organization, except in point of numbers, has lost nothing during the past season and retains its excellent position among the best of separate companies.

THIRD SEPARATE COMPANY, ONEONTA.

Inspected October 6, 1887.

	Present.	Absent.	Aggregate.
Officers	2	1	.....
Enlisted men	79	8	.....
Total	81	9	90

Percentage present, 90.00

The improvement in general appearance and drill of this company is highly creditable. The commanding officer has worked hard and faithfully, and his reward is apparent.

FOURTH SEPARATE COMPANY, YONKERS.

Inspected June 22, 1887.

	Present.	Absent.	Aggregate.
Officers	4	.....	.....
Enlisted men	57	2	.....
Total	61	2	6

Percentage present, 96.82.

This company is in a prosperous condition, has decidedly improved in every way during the past season, and a continuance of the good work will soon place it with the best of companies.

FIFTH SEPARATE COMPANY, NEWBURGH.

Inspected August 29, 1887.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	60	14	.....
Total	63	14	7

Percentage present, 81.81.

This company has recently taken in a large number of recruits, which in a measure accounted for a ragged drill. Hard work must be done during the coming drill season to bring it up to the proper standard.

SIXTH SEPARATE COMPANY, TROY.

Inspected June 14, 1887.

	Present.	Absent.	Aggregate.
Officers	3	1	.....
Enlisted men	94	6	.....
Total	97	7	10

Percentage present, 93.26.

An organization which in every way maintains its high standard of discipline and *esprit de corps*. A credit to the State and itself.

SEVENTH SEPARATE COMPANY, COHOES.

Inspected June 9, 1887.

	Present.	Absent.	Aggregate.
Officers	4	.....	.....
Enlisted men	61	3	.....
Total	65	3	6

Percentage present, 95.58.

This company shows a gain of thirteen in aggregate and thirteen resent as compared with last muster. The same remarks as made ast year will again apply — *i. e.*, "more thorough and particular nstruction." The company is good and reliable, well made up, and here is no reason why it should not improve.

The sergeant acting as left guide is sadly deficient in all that ppertains to his duties, careless in his demeanor, and anything but n example, as he should be, to the men.

EIGHTH SEPARATE COMPANY, ROCHESTER.

Inspected August 24, 1887.

	Present.	Absent.	Aggregate.
fficers	3	.....	.....
nlisted men	44	12	.....
Total	47	12	59

Percentage present, 79.66.

This is one of the best companies in the State, and should be ecruited to the full number without delay, when in every respect it ill be a perfect organization. Its discipline and drill are of high rder.

NINTH SEPARATE COMPANY, WHITEHALL.

Inspected August 15, 1887 — *By Lieut.-Col.* F. C. McLEWEE.

	Present.	Absent.	Aggregate.
fficers	1	1	.....
nlisted men	22	12	.....
Total	23	13	36

Percentage present, 63.88.

This organization is practically useless and should be disbanded for he good of the service. The second lieutenant is an incompetent fficer and performs but little duty (about twenty-five per cent), and he company is in a very demoralized condition.

TENTH SEPARATE COMPANY, NEWBURGH.

Inspected June 21, 1887.

	Present.	Absent.	Aggregate.
fficers	3	.....	.....
nlisted men	44	7	.....
Total	47	7	54

Percentage present, 87.03.

This company still maintains its good standing, and while it cannot be said to have materially improved, it has certainly lost nothing in efficiency since last inspection. A closer study and discussion of tactics will cause the few errors noted to be corrected.

ELEVENTH SEPARATE COMPANY, MT. VERNON.

Inspected September 1, 1887.

	Present.	Absent.	Aggregate.
Officers	3	1	.....
Enlisted men	46	8	.....
Total	49	9	58

Percentage present, 84.48.

Company has lost four (4) in aggregate since last muster. It is an excellent organization, well worthy of the new armory about to be erected, and will undoubtedly recruit to a full standard before another year.

TWELFTH SEPARATE COMPANY, TROY.

Inspected June 10, 1887.

	Present.	Absent.	Aggregate.
Officers	2	.....	.....
Enlisted men	56	42	.....
Total	58	42	100

Percentage present, 58.

Shows a gain of six in aggregate and loss of nine in present, as compared with muster of 1886. The large absentee list is indicative of poor discipline and lack of pride in the organization. Non-commissioned officers should be required to attend all duties or be returned to the ranks. Company has made no progress, either in appearance or drill, during the past year, which reflects entirely and solely on the commissioned officers. * * * * *

THIRTEENTH SEPARATE COMPANY, JAMESTOWN.

Inspected May 24, 1887 — *By Lieut.-Col.* F. C. MCLEWEE.

	Present.	Absent.	Aggregate.
Officers	1	.....	.....
Enlisted men	45	0	.....
Total	46	9	55

Percentage present, 83.63.

This company, in every respect, shows a lack of proper instruction; spitting on the armory floor to the extent exhibited is in the highest degree disgusting, and is neither a mark of a gentleman nor a soldier. Military courtesy absolutely ignored. Since the inspection the company has been practically reorganized and is now in a thriving condition.

FOURTEENTH SEPARATE COMPANY, KINGSTON.

Inspected June 20, 1887.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	52	19	.....
Total	55	19	74

Percentage present, 74.32.

A loss of nine (9) present and a gain of one (1) in aggregate as compared with last muster. The decline in drill and enthusiasm during the past year is marked, which, if continued, will jeopardize the existence of the company.

FIFTEENTH SEPARATE COMPANY, POUGHKEEPSIE.

Inspected June 23, 1887.

	Present.	Absent.	Aggregate.
Officers	2	.....	.....
Enlisted men	42	16	.....
Total	44	16	60

Percentage present, 73.33.

What was termed "not very good" as to the drill of this company, last inspection, is now decidedly poor. Men who do not attend drills cannot expect to become soldiers. Unless a change is soon made to the betterment of this company its disbandment will be recommended.

SIXTEENTH SEPARATE COMPANY, CATSKILL.

Inspected June 17, 1887.

	Present.	Absent.	Aggregate.
Officers	1	3	.....
Enlisted men	49	9	.....
Total	50	12	62

Percentage present, 80.64.

This company has improved both in numbers and instruction, yet there remains much good work to be done that it may approach perfection. A closer study of tactics cannot but accomplish better results.

SEVENTEENTH SEPARATE COMPANY, FLUSHING.

Inspected September 2, 1887 — *By Lieut.-Col.* F. C. McLEWEE.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	44	6	.....
Total	47	6	53

Percentage present, 88.67.

It is a pleasure to have the honor of officially visiting such an organization, which needs but a few additional numbers to make it a perfect company. All officers well informed.

EIGHTEENTH SEPARATE COMPANY, GLENS FALLS.

Inspected May 18, 1887.

	Present.	Absent.	Aggregate.
Officers	4	.....	.....
Enlisted men	30	11	.....
Total	34	11	45

Percentage present, 75.55.

This company shows an improvement in discipline and military courtesy. The drill after inspection, while not in all respects, either as regards the commands of the captain or the execution of movements tactically, correct, was an improvement on that of a year ago. Much work yet to be done.

NINETEENTH SEPARATE COMPANY, POUGHKEEPSIE.

Inspected August 30, 1887.

	Present.	Absent.	Aggregate.
Officers	4	.....	.....
Enlisted men	85	13	.....
Total	89	13	102

Percentage present, 87.25.

A most excellent organization. In physique, discipline and drill it as very few equals in companies of the National Guard.

TWENTIETH SEPARATE COMPANY, BINGHAMTON.

Inspected October 3, 1887.

	Present.	Absent.	Aggregate.
Officers	4	.....	.....
Enlisted men	65	13	.....
Total	69	13	82

Percentage present, 84.14.

The company shows a still further improvement during the past year. A little more care in dress, particularly as to cleanliness of brasses and shoes, would very much help the general appearance. Such a well made-up company, so ably officered, should lack in nothing that appertains to a first-class organization.

TWENTY-FIRST SEPARATE COMPANY, TROY.

Inspected June 13, 1887.

	Present.	Absent.	Aggregate.
Officers	2	1	.....
Enlisted men	63	5	.....
Total	65	6	71

Percentage present, 91.54.

Show a loss of one (1) on aggregate and five (5) present, compared with muster of 1886. Officers without regulation dress uniforms. Braid on sleeve of fatigue blouse not correct. A very good company, and can be made excellent with proper handling. The captain, while sharp in his commands, is too slow in getting at a desired movement, and in many cases absolutely wrong in his commands. Second lieutenant more correct in his commands, but should sharpen up. First sergeant deserves special mention for the ability and dignity with which he fills his position.

TWENTY-SECOND SEPARATE COMPANY, SARATOGA SPRINGS.

Inspected May 19, 1887.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	73	5	.....
Total	76	5	81

Percentage present, 93.82.

This company maintains its reputation as a thoroughly reliable organization in every way. An improvement appears in the drill of the company, particularly in the loadings and firings. All evidence of a good winters work.

TWENTY-THIRD SEPARATE COMPANY, HUDSON.

Inspected June 16, 1887.

	Present.	Absent.	Aggregate.
Officers	3	1	.....
Enlisted men	43	18	.....
Total	46	19	65

Percentage present, 70.76.

This company has lost in numbers, since muster of 1886, thirteen in present and nine in aggregate; it has depreciated in drill and discipline, and an apparent apathy exists which must at once be looked to, or the existence of the company will be very doubtful. Since inspection a new captain has been elected and new life instilled.

TWENTY-FOURTH SEPARATE COMPANY, MIDDLETOWN.

Inspected August 26, 1887 — *By Lieut.-Col.* F. C. McLEWEE.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	57	3	.....
Total	60	3	63

Percentage present, 95.23.

All officers and non-commissioned officers require immediate and prolonged study, that the company may have proper instruction.

TWENTY-FIFTH SEPARATE COMPANY, CANANDAIGUA.

Inspected August 23, 1887 — *By Lieut.-Col.* F. C. McLEWEE.

	Present.	Absent.	Aggregate.
Officers	2	2	.....
Enlisted men	16	11	.....
Total	18	13	31

Percentage present, 58.06.

The commanding officer of this company has not been present in a year; the two lieutenants are much in need of instruction. The attendance at drill is only about 40 per cent, and the company demoralized to such an extent that it ought to be disbanded for the good of the service.

TWENTY-SIXTH SEPARATE COMPANY, ELMIRA.

Inspected June 1, 1887.

	Present.	Absent.	Aggregate.
Officers	1	.....	.....
Enlisted men	86	8	.....
Total	87	8	95

Percentage present, 91.57.

While the company shows a loss of nine (9) in aggregate and seven (7) present as compared with last muster, it has improved in all other respects. Material good, willing and anxious to do better. The armory floor soiled with tobacco juice is the only lack of pride and neatness exhibited.

TWENTY-SEVENTH SEPARATE COMPANY, MALONE.

Inspected August 16, 1887.

	Present.	Absent.	Aggregate.
Officers	1	1	.....
Enlisted men	47	13	.....
Total	48	14	62

Percentage present, 77.41.

This company is much in need of a competent commanding officer, and the non-commissioned officers show a lack of study and instruction. In proper hands a first-class organization can be made of it.

TWENTY-EIGHTH SEPARATE COMPANY, UTICA.

Inspected May 11, 1887.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	48	17	.....
Total	51	17	68

Percentage present, 75.

Drill and discipline very poor. Officers should at once inform themselves regarding their duties. Either read or resign.

TWENTY-NINTH SEPARATE COMPANY, OSWEGO.

Inspected May 13, 1887.

	Present.	Absent.	Aggregate.
Officers	3	1	.....
Enlisted men	44	15	.....
Total	47	16	63

Percentage present, 74.60.

In general appearance and to a certain extent in discipline the company has improved. In drill little or no improvement is shown. The officers should read and inform themselves more thoroughly. Second lieutenant very deficient.

THIRTIETH SEPARATE COMPANY, ELMIRA.

Inspected June 2, 1887.

	Present.	Absent.	Aggregate.
Officers	1	.....	.....
Enlisted men	68	1	.....
Total	69	1	70

Percentage present, 98.57.

The company maintains its rating as among the first and best separate companies, and is decidedly a credit to itself and the State. At present without other officers than the captain, who is entitled to great credit for the excellence of his command.

THIRTY-FIRST SEPARATE COMPANY, MOHAWK.

Inspected May 10, 1887.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	56	5	.....
Total	59	5	64

Percentage present, 92.18.

The company has made creditable improvement in demeanor and general appearance, but little, if any, in drill. Officers require to do much study to enable themselves to command with ability.

THIRTY-SECOND SEPARATE COMPANY, HOOSICK FALLS.

Inspected June 15, 1887.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	72	2	.....
Total	75	2	77

Percentage present, ...

This company has made marked and commendable improvement in drill, discipline and military courtesy, and now may be classed with the best of separate companies.

THIRTY-THIRD SEPARATE COMPANY, WALTON.

Inspected October 5, 1887.

	Present.	Absent.	Aggregate.
Officers	2	2	.....
Enlisted men	57	8	.....
Total	59	10	69

Percentage present, 85.50.

In general appearance and discipline the company appears to have made great improvement since last inspected. With the very comfortable and commodious armory provided, still further advance is to be looked for. The company is efficient and a credit to the State.

THIRTY-FOURTH SEPARATE COMPANY, GENEVA.

Inspected August 23, 1887.

	Present.	Absent.	Aggregate.
Officers	2	1	.....
Enlisted men	37	17	.....
Total	39	18	57

Percentage present, 68.42.

This company has somewhat progressed during the past year, but there is still great room for improvement. Good material should go ahead.

THIRTY-FIFTH SEPARATE COMPANY, OGDENSBURG.

Inspected August 17, 1887.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	58	13	.....
Total	61	13	74

Percentage present, 82.43.

An excellent company, needing only to be perfected in drill; that is, the drill needs finish, movements in company and the manual being in the main fairly performed. Theoretical schools of officers and non-commissioned officers should be held weekly, and will be found of great value.

THIRTY-SIXTH SEPARATE COMPANY, SCHENECTADY.

Inspected May 20, 1887.

	Present.	Absent.	Aggregate.
Officers	4	.....	.....
Enlisted men	52	2	.....
Total	56	2	58

Percentage present, 96.55.

This company shows a marked improvement in military courtesy, discipline and general appearance.

The creditable drill gives evidence of good and faithful work during the past season.

THIRTY-SEVENTH SEPARATE COMPANY, SCHENECTADY.

Inspected May 20, 1887.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	45	11	.....
Total	48	11	59

Percentage present, 81.35.

In military appearance and discipline there appears to be a decline as compared with last inspection. The company did not exhibit the same life and snap which was marked at the last inspection. The company is well officered and should not decline.

THIRTY-EIGHTH SEPARATE COMPANY, OSWEGO.

Inspected August 15, 1887.

	Present.	Absent.	Aggregate.
Officers	2	.....	.....
Enlisted men	54	12	.....
Total	56	12	63

Percentage present, 82.35.

A very creditable inspection, giving evidence of good work. An organization which will undoubtedly prosper and improve.

THIRTY-NINTH SEPARATE COMPANY, WATERTOWN.

Inspected August 16, 1887.

	Present.	Absent.	Aggregate.
Officers	2	2	.....
Enlisted men	61	24	.....
Total	63	26	89

Percentage present, 70.78.

Company still maintains its rating as an excellent organization, and shows improvement since last muster.

FORTIETH SEPARATE COMPANY, SYRACUSE.

Inspected May 12, 1887.

	Present.	Absent.	Aggregate.
Officers	2	.....	.....
Enlisted men	52	17	.....
Total	54	17	71

Percentage present, 76.05.

Company without captain and first lieutenant. Newly elected captain not yet commissioned. With the new element recently added good results are to be expected.

FORTY-FIRST SEPARATE COMPANY, SYRACUSE.

Inspected August 18, 1887.

	Present.	Absent.	Aggregate.
Officers	4	.....	.....
Enlisted men	46	22	.....
Total	50	22	72

Percentage present, 69.44.

The drill, discipline and efficiency of this company is of a very high order. The perfection in loading and firing to be specially mentioned and commended.

FORTY-SECOND SEPARATE COMPANY, NIAGARA FALLS.

Inspected May 27, 1887.

	Present.	Absent.	Aggregate.
Officers	4	.....	.....
Enlisted men	86	12	.....
Total	90	12	102

Percentage present, 88.23.

The material of this command rates with the best in the State. While creditable progress has been made since its organization, there is yet much to be done in order that a standard of drill commensurate with the make-up of its organization shall be attained. Loadings and firings need special attention.

FORTY-THIRD SEPARATE COMPANY, OLEAN.

Inspected August 25, 1887.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	64	7	.....
Total	67	7	74

Percentage present, 90.54.

Considering the short time this company has existed, the progress made in discipline and drill is very creditable. Theoretical drills, reading and discussing the tactics, and energetic work will place this organization among the best in the service.

Better armory accommodation is very much needed.

FORTY-FOURTH SEPARATE COMPANY, UTICA.

Mustered-in September 27, 1887.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	54	.....	.....
Total	57	.....	57

This company was mustered into the service by Colonel Thomas H. McGrath, A. I. G., on September 27, 1887. It is composed of a class of men who should, and undoubtedly will, complete an organization which will be a valuable acquisition to the National Guard.

FIRST BATTERY, NEW YORK CITY.

Inspected October 14, 1887.

	Present.	Absent.	Aggregate.
Officers	4	.....	.....
Enlisted men	100	3	.....
Total	104	3	107

Percentage present, 97.19.

The battery is to be complimented for its neat and orderly appearance and excellence of drill. The improvement during the past year has been vast. The drill (dismounted) of the entire battery, including mechanical manœuvres, was performed with astonishing accuracy.

SECOND BATTERY, NEW YORK CITY.

Inspected October 17, 1887.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	98	3	.....
Total	101	3	104

Percentage present, 97.11.

This battery is in every respect a reliable and efficient organization. The room used for inspection having been condemned by the authorities, no drill could be had, but the excellent record of the organization, during its tour of camp duty, is sufficient to give it a high rating.

It is a disgrace to the great city of New York that so valuable an organization should be so meanly provided for.

THIRD BATTERY, BROOKLYN.

Inspected October 13, 1887.

	Present.	Absent.	Aggregate.
Officers	5	.....	.....
Enlisted men	52	6	.....
Total	57	6	63

Percentage present, 90.47.

The drill of two sections a marked improvement on last year. The high standard of appearance and efficiency is maintained, and the organization should continue to prosper under its efficient officers. Limbers and caissons need painting. Trails of howitzers broken and should be renewed. In other respects all the equipment is in good serviceable condition.

FIFTH BATTERY, SYRACUSE.

Inspected May 12, 1887.

	Present.	Absent.	Aggregate.
Officers	5	1	.....
Enlisted men	54	13	.....
Total	59	14	73

Percentage present, 80.82.

A good organization; well commanded and officered, and thoroughly efficient.

SIXTH BATTERY, BINGHAMTON.

Inspected October 4, 1887.

	Present.	Absent.	Aggregate.
Officers	3	.....	.....
Enlisted men	57	7	.....
Total	60	7	67

Percentage present, 89.55.

This organization, which has already achieved high reputation, excelled its best inspection and drill on this occasion. Officers and men have every reason to be proud of the command.

In the course of these inspections I have been assisted by Major A. P. Montant, inspector First Brigade, and Major Gustave A. Jahn, inspector Second Brigade. To both of these officers my thanks are due for services and courtesy extended by them.

To Lieut.-Col. F. C. McLewee, Assistant Inspector-General, I am again called on to tender my sincere thanks for very valuable assistance.

This officer is not only competent, but thorough, conscientious, enthusiastic in his work, at all times fearless in his criticism, and perfectly adapted to fill the delicate position of an inspector.

I have the honor to be, General, very respectfully,

Your obedient servant,

THOMAS H. McGRATH,

Colonel and Assistant Inspector-General.

(E.)

REPORT OF THE CHIEF OF ORDNANCE FOR 1887.

STATE OF NEW YORK:

OFFICE OF CHIEF OF ORDNANCE,
NEW YORK, *December* 15, 1887.

The Adjutant-General, State of New York:

SIR.—I have the honor to report the following purchases and expenditures, account of State Camp for season of 1887, detailed accounts of same have previously been forwarded to you, viz.:

Blank cartridges and cartridge bags		$2,085 00
Candles, candlesticks, oil, lanterns, etc		527 60
Tin-plating knives and forks		110 44
New blankets		1,435 78
Cots, mattresses and stools		919 00
Pails, brooms, rakes, wheelbarrows, mallets, etc		348 95
Crockery		318 50
Coal for pump		24 00
Hardware, nails, spades, etc		264 91
Hay, oats, straw and seed		223 75
Lumber and carpenter work		133 50
Medical supplies, disinfectants, assistance medical department		652 09
Transportation camp equipage and stores		557 00
Carting camp equipage and baggage of troops from dock to camp ground and return	$663 26	
Services engineer, watchman, labor, express charges, freight, disinfector, scavengers, stationery, telegrams, hire of ambulance, etc., etc	3,884 25	
		4,547 51

Transportation of troops to and from camp	$5,957 79
Subsistence of troops	34,510 63
Hire of horses for use of field officers	638 00
	$53,254 45

Very respectfully yours.

J. M. VARIAN,

Brig.-Gen. and Chief of Ordnance, S. N. Y.

STATE OF NEW YORK:

OFFICE OF CHIEF OF ORDNANCE,
NEW YORK, ——— 188 .

The Adjutant-General, State of New York:

SIR.—Pursuant to M. C. 21, I have the honor to submit herewith a detailed report of the business of this department from October 1, 1886, to September 30, 1887, inclusive.

Abstract A. Receipts and disbursements of cash in the Ordnance Department, S. N. Y., from October 1, 1886, to September 30 1887, inclusive.

Abstract B. Annual return of ordnance and ordnance stores and other military property, in charge of Brigadier-General J. M. Varian, Chief of Ordnance, and Acting Quartermaster-General, S. N. Y., for year ending September 30, 1887.

Abstract C. Military property of the State of New York, issued to organizations of the National Guard, S. N. Y., and State officers during the year ending September 30, 1887.

Abstract D. Military property of the State of New York received from organizations of the National Guard, S. N. Y., for year ending September 30, 1887.

Abstract E. Receipts and disbursements of cash under a commission consisting of Josiah Porter, Adjutant-General, S. N. Y.; Emil Schaefer, Inspector-General, S. N. Y., and J. M. Varian, Chief of Ordnance, S. N. Y., appointed by law for the building and improvement of State armories and improvement of State camp grounds.

Very respectfully yours.

J. M. VARIAN,

Brigadier-General and Chief of Ordnance, S. N. Y.

ABSTRACT A.

RECEIPTS AND DISBURSEMENTS OF CASH IN THE ORDNANCE DEPARTMENT, STATE OF NEW YORK, FROM SEPTEMBER 30, 1886, TO SEPTEMBER 30, 1887.

Receipts.

Cash on hand (in Contingent Fund)	$4,243 67
Cash received from State Treasurer in payment of services of employes Ordnance Department, as per detailed monthly accounts	17,349 88
Cash received from State Treasurer in payment of expenditures, as per detailed monthly accounts	4,208 25
Cash received from State Treasurer in payment transportation troops to rifle ranges, as per detailed monthly accounts	2,002 11
Cash received from State Treasurer in payment purchase targets and repairs to rifle ranges, as per detailed monthly accounts	848 66
Cash received from State Treasurer in payment purchases under special orders from General Headquarters, as per detailed monthly accounts	47,998 78
Cash received from State Treasurer for repairs arsenals and armories, as per detailed monthly accounts	2,899 38
Cash received from State Treasurer in payment purchases, expenditures, transportation, subsistence, etc., on account State Camp, season 1887, as per detailed special report	53,254 45
Cash received from State Treasurer for transportation Fourteenth and Sixty-ninth regiments, New York, to Saratoga and return	3,535 20
Cash received from sale at auction of condemned property	10,018 90
	$146,359 28

Disbursements.

Cash paid employes Ordnance Department, as per detailed monthly accounts	$17,349 88
Cash paid expenditures, as per detailed monthly accounts,	4,208 25
Cash paid, transportation troops to rifle ranges, as per detailed monthly accounts	2,002 11
Cash paid, purchases targets and repairs to rifle ranges, as per detailed monthly accounts	848 66

Cash paid, purchases under special orders from General Headquarters, as per detailed monthly accounts.....	$47,998 78
Cash paid, repairs arsenals and armories, as per detailed monthly accounts.....	2,899 38
Cash paid, purchases, expenditures, transportation, subsistence, etc., on account State Camp, season 1887, as wer detailed special report.....	53,254 45
Cash paid, transportation Fourteenth and Sixty-ninth regiments, New York, to Saratoga and return.....	3,535 20
Cash paid from contingent fund, account purchases, as per direction General Headquarters	10,500 00
Balance on hand.....	3,762 57
	$146,359 28

ABSTRACT B.

Annual return of ordnance and ordnance stores and other public property in charge of Brigadier-General J. M. Varian, Chief of Ordnance and Acting Quartermaster-General, S.N.Y., for year ending September 30, 1887.

	Parrott guns, 20-pounder.	Delafield guns, 20-pounder.	Field howitzers, 12-pounder.	Mountain howitzers, 12-pounder.	Napoleon guns, 12-pounder.	Parrott guns, 10-pounder.	Brass guns, 6-pounder.	Iron guns, 6-pounder.	Steel guns, 3-inch.	Brass guns, 3-pounder.	Brass guns, 2-pounder.	Brass guns, Spanish.	Brass guns, English trophy.	Gatling guns, calibre 60.	Mortars, 8-inch.	Mortars, 6-inch.	Breech sights.	Quadrants.	Gunners' calipers.	Elevation screw and bed.	Lifting jacks.	Assembly rest, for Gatling gun.	Gun carriages.	Caissons.
On last annual return	2	4	3	6	8	15	1	2	2	2	1	1	1	2	1	1	14	....	....	1	1	1	37	21
Purchased, received upon requisition, taken up, fabricated, etc	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	....	....	....	....	....
Received from organizations of National Guard	....	....	4	2	....	....	....	....	4	....	....	....	....	2	....	....	....	....	....	....	....	....	8	4
Total	2	4	7	8	8	15	1	2	6	2	1	1	1	4	1	1	14	1	2	1	1	1	45	25
Issued	....	....	....	3	2	....	....	....	....	....	....	....	....	1	....	....	....	1	2	...	1	....	6	2
Serviceable and unserviceable property on hand	2	4	7	5	6	15	1	2	6	2	1	1	1	3	1	1	14	....	....	1	...	1	39	23
Serviceable property on hand	....	....	....	....	....	....	....	....	6	....	....	....	....	3	....	....	....	....	....	....	...	1	4	2
Unserviceable property on hand	2	4	7	5	6	15	1	2	....	2	1	1	1	....	1	1	14	....	....	1	....	....	35	21
Unserviceable property sold, condemned, expended and destroyed	....	....	....	*1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
On hand to be accounted for, serviceable	....	....	....	....	....	....	....	....	6	....	....	....	....	3	....	....	....	....	....	....	....	1	4	2
On hand to be accounted for, unserviceable	2	4	7	4	6	15	1	2	....	2	1	1	1	....	1	1	14	....	....	1	....	....	35	21
Total on hand to be accounted for	2	4	7	4	6	15	1	2	6	2	1	1	1	3	1	1	14	....	....	1	....	1	39	23

*Carried erroneously.

ABSTRACT B—*(Continued).*

	Limbers.	Battery wagons.	Traveling forges.	Spare wheels.	Spare poles.	Hand tongues.	Tompions and straps.	Pendulum hausse and pouches.	Trail handspikes.	Sponges.	Sponge covers.	Watering buckets.	Vent covers.	Pole pads.	Pole straps.	Tarpaulens.	Priming wires.	Thumbstalls.	Gunners' gimlets.	Fuse wrenches.	Fuse gauges.	Vent punches.	Hooks and lanyards.	Sponge and rammer staves.
On last annual return	25	1	2	24	23	....	6	29	56	16	1	25	4	....	16	17	20	23	5	4	2	2	16	....
Purchased, received upon requisition, taken up, fabricated, etc	....	....	....	....	....	....	4	....	2	16	8	....	....	8	....	....	12	24	2	....	2	2	8	2
Received from organizations of National Guard	12	....	....	4	5	1	6	4	19	9	4	12	6	....	....	8	16	1	2	....	....	4	5	....
Total	37	1	2	28	28	1	16	33	77	41	13	37	10	8	16	25	48	48	9	4	4	8	29	2
Issued	8	....	....	2	2	....	9	2	8	12	8	9	5	8	8	4	18	25	6	....	2	4	20	2
Serviceable and unserviceable property on hand	29	1	2	26	26	1	7	31	69	29	5	28	5	....	8	21	30	23	3	4	2	4	9	....
Serviceable property on hand	4	....	....	....	....	1	....	....	....	....	5	14	....	....	....	13	....	....	....	....	....	4	....	....
Unserviceable property on hand	25	1	2	26	26	....	7	31	69	29	....	14	5	....	8	8	30	23	3	4	....	....	9	....
Unserviceable property sold, condemned, expended and destroyed	....	....	....	....	....	....	....	....	....	....	5	....	....	....	8	....	....	....	....	4	2	....	....	....
On hand to be accounted for, serviceable	4	....	....	....	....	1	....	....	....	....	....	14	....	....	....	13	....	....	....	....	....	4	....	....
On hand to be accounted for, unserviceable	25	1	2	26	26	....	7	31	69	29	....	14	5	....	....	8	30	23	3	....	....	....	9	....
Total on hand to be accounted for	29	1	2	26	26	1	7	31	69	29	....	28	5	....	....	21	30	23	3	....	....	4	9	....

ABSTRACT B — *(Continued).*

	Rammers and staves.	Rammers and sponges	Sponge heads.	Worms and staves.	Worms.	Tube pouches and belts.	Sponge buckets.	Tar buckets.	Pickaxes.	Cushions for limber chests.	Drag ropes.	Prolonges.	Leg guards.	Harness sets, 2-horse wheel.	Harness sets, 2-horse lead.	Trace hooks.	Gunners' haversacks.	Gunners' pouches.	Monkey wrenches.	Gatling gun feed cases.	Gatling gun feed case pouches.	Saddles.	Bridles.
On last annual return	2	26	26	....	....	....	....	6	10	62	....	1	8	3	3	16	6	8	....	52	....	622	572
Purchased, received upon requisition, taken up, fabricated, etc	....	....	4	....	....	....	1	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....
Received from organizations of National Guard	19	....	....	5	2	14	6	15	4	....	2	8	8	13	13	...	8	....	1	....	3	44	52
Total	21	26	30	5	2	14	7	21	14	62	5	9	16	16	16	16	14	8	1	52	3	666	624
Issued	6	4	4	3	....	9	5	4	2	6	5	4	4	4	4	....	7	....	1	....	....	1	1
Serviceable and unserviceable property on hand	15	22	26	2	2	5	2	17	12	56	....	5	12	12	12	16	7	8	....	52	3	665	623
Serviceable property on hand	....	....	....	....	....	....	....	....	12	....	....	....	....	....	....	....	....	....	....	52	2	.....	13
Unserviceable property on hand	15	22	26	2	2	5	2	17	....	56	....	5	12	12	12	16	7	8	....	....	1	655	610
Unserviceable property sold, condemned, expended and destroyed	....	....	....	....	2	....	....	....	....	....	....	....	....	*12	*12	16	....	8	....	....	1	382	355
On hand to be accounted for, serviceable	....	....	....	....	....	....	....	....	12	....	....	....	....	....	....	....	....	....	....	52	2	.....	13
On hand to be accounted for, unserviceable	15	22	26	2	....	5	2	17	....	56	....	5	12	...	....	....	7	....	....	....	....	283	255
Total on hand to be accounted for	15	22	26	2	....	5	2	17	12	56	....	5	12	....	....	....	7	....	....	52	2	283	268

*The "sets" being incomplete, were disposed of by carrying them in parts, with the exception of one "set," which is carried as "Gatling gun harness."

ABSTRACT B — *(Continued).*

	Bridle bits.	Nosebags.	Stirrups.	Stirrup straps.	Cruppers.	Drivers' whips.	Martingales and collars.	Shabracks.	Surcingles.	Spurs.	Spur straps.	Sweat leathers.	Saddle cloths.	Saddle girths.	Halters.	Breechings.	Horse collars.	Saddle valises.
On last annual return	600	123	1,094	1,094	....	44	538	13	....	1,023	968	134	29	1	32	....	32	15
Purchased, received upon requisition, taken up, fabricated, etc.	....	....	....	....	48	....	....	....	....	....	....	....	....	....	....	24	14	....
Received from organizations of National Guard,	53	8	41	41	11	16	41		1	22	8	....	124	25	29	2	2	....
Total		131	1,135	1,135	59	60	579	13	1	1,045	976	134	153	26	61	26	48	15
Issued	1	16	....	....	....	13	1	....	...	6	6	....	10	....	16	....	....	....
Serviceable and unserviceable property on hand	652	115	1,135	1,135	59	47	578	13	1	1,039	970	134	143	26	45	26	48	15
Serviceable property on hand	13	33	....	....	....	....	13	13	....	.....	.....	....	....	....	....	....	....	....
Unserviceable property on hand	639	82	1,135	1,135	59	47	565	....	1	1,039	970	134	143	26	45	26	48	15
Unserviceable property sold, condemned, expended and destroyed	355	82	774	774	59	7	312	....	1	707	970	134	....	....	....	....	....	....
On hand to be accounted for, serviceable	13	33	....	....	....	....	13	13	....	.....	....	....	....	....	....	....	....	....
On hand to be accounted for, unserviceable	284	....	361	361	....	40	253	....	....	332	....	....	143	26	45	26	48	15
Total on hand to be accounted for	297	33	361	361	...	40	266	13	...	332	.....	....	143	26	45	26	48	15

ABSTRACT B—*(Continued).*

	Saddle bags.	Hames.	Hame straps.	Wheel traces.	Lead traces.	Handspike straps.	Sponge-stave straps.	Drag rope straps.	Gun sling for mountain howitzers.	Trussing straps.	Belly-bands.	Coupling reins.	Back straps.	Hip straps.	Trace loops.	Valise straps.	Slide loops.	Breast straps.	Hooks and loops.	Gatling gun harness, (sets).	Hand grenades.	Shells, 24-pounder, spherical.	Shells 20-pounder, parrott.	Shells, 20-pounder, elongated.
On last annual return	6	....	8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...	10	129	121	456
Purchased, received upon requisition, taken up, fabricated, etc	100	96	48	48	48	8	12	12	4	53	41	24	48	24	96	48	24	24	98	1	....	....	....	....
Received from organizations of National Guard	1	4	....	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	107	100	56	52	48	8	12	12	4	53	41	24	48	24	96	48	24	24	98	1	10	129	121	456
Issued	....	....	....	....	....	8	12	12	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Serviceable and unserviceable property on hand	107	100	56	52	48	....	....	....	....	53	41	24	48	24	96	48	24	24	98	1	10	129	121	456
Serviceable property on hand	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Unserviceable property on hand	107	100	56	52	48	...	....	....	....	53	41	24	48	24	96	48	24	24	98	1	10	129	121	456
Unserviceable property sold, condemned, expended and destroyed	75	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
On hand to be accounted for, serviceable	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
On hand to be accounted for, unserviceable	32	100	56	52	48	...	....	....	....	53	41	24	48	24	96	48	24	24	98	1	10	129	121	456
Total on hand to be accounted for	32	100	56	52	48	....	....	....	....	53	41	24	48	24	96	48	24	24	98	1	10	129	121	456

ABSTRACT B — *(Continued).*

	Shells, 12 pounder.	Shells, 10 pounder, 3 inch.	Shells, 6-pounder.	Shells, 3 inch, Absterdam.	Shells, 2 9-10 inches, ordnance.	Hotchkiss projectiles, 10-pounder.	Case shot, 20-pounder.	Case shot, 12-pounder.	Case shot, 10-pounder, ordnance.	Case shot, 6-pounder.	Case shot, 3 inches, Absterdam.	Strap shot, 6-pounder.	Solid shot, 12-pounder.	Solid shot, 9-pounder.	Solid shot, 6-pounder.
On last annual return	1,032	316	1,192	1,036	501	2,506	300	823	387	1,106	470	306	450	137	1,454
Purchased, received upon requisition, taken up, fabricated, etc	.....	....	.....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Received from organizations of National Guard	.....	....	.....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Total	1,032	316	1,192	1,036	501	2,506	300	823	387	1,106	470	306	450	137	1,454
Issued	.....	....	.....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Serviceable and unserviceable property on hand	1,032	316	1,192	1,036	501	2,506	300	823	387	1,106	470	306	450	137	1,454
Serviceable property on hand	1,032	....	1,192	.....	....	.....	....	....	....	.....	....	306	450	137	1,454
Unserviceable property on hand	.....	316	.....	1,036	501	2,506	300	823	387	1,106	470	...	....	....	.....
Unserviceable property sold, condemned, expended and destroyed	.....	....	.....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
On hand to be accounted for, serviceable	1,032	...	1,192	.....	....	.....	....	....	....	.....	....	306	450	137	1,454
On hand to be accounted for, unserviceable	.....	316	.....	1,036	501	2,506	300	823	387	1,106	470	....	....	....	.....
Total on hand to be accounted for	1,032	316	1,192	1,036	501	2,506	300	823	387	1,106	470	306	450	137	1,454

ABSTRACT B—*(Continued).*

	Canister shot, 12-pounder.	Canister shot, 6-pounder.	Canister shot, 3-inch.	Cannon powder, pounds of.	Cartridge bags.	Blank cannon cartridges.	Time fuse.	Metallic ball cartrig's, calibre 45 (revolver).	Friction primers.	Berdan primers.	Metallic ball cartridges, 50-70.	Blank metallic cartridges, calibre 50.	Remington rifles, calibre 50.
On last annual return	840	2,571	199	450	....	....	211	8,000	26,750	15,000	927,653	54,953	4,434
Purchased, received upon requisition, taken up, fabricated, etc	....	.....	....	....	425	430	....	.....	500	.....	400,000	150,000	.....
Received from organizations of National Guard	....	.....	...	....	247	....	....	.....	112	.....	19,280	.....	242
Total	840	2,571	199	450	672	430	211	8,000	27,362	15,000	1,346,933	204,593	4,676
Issued	....	.....	....	....	....	430	....	.....	5,000	.....	558,526	111,900	435
Serviceable and unserviceable property on hand	840	2,571	199	450	672	....	211	8,000	22,362	15,000	788,407	92,693	4,241
Serviceable property on hand	840	2,571	199	450	525	....	....	8,000	22,000	.....	720,000	79,425	4,058
Unserviceable property on hand	....	.....	....	....	147	...	211	.....	362	15,000	68,407	13,268	183
Unserviceable property sold, condemned, expended, and destroyed	....	.....	....	450	672	....	....	.....	362	.....	.....	.....	.....
On hand to be accounted for, serviceable	840	2,571	199	....	....	....	....	8,000	22,000	15,000	720,000	79,425	4,058
On hand to be accounted for, unserviceable	....	.....	....	....	....	....	211	.....	..	.....	68,407	13,268	183
Total on hand to be accounted for	840	2,571	199	....	....	....	211	8,000	22,000	15,000	788,407	92,693	4,241

ABSTRACT B—*(Continued).*

	Remington bayonets.	Cadet muskets.	Cadet musket bayonets	Whitney rifles, calibre 44.	Springfield muskets.	Springfield bayonets.	Enfield rifles.	Enfield bayonets.	Remington carbines, calibre 50.	Smith carbines.	Ballard carbines.	Revolvers (muzzle-loaders.)	Revolvers (breech-loaders, calibre 45.	Cavalry pistols (muzzle loaders).	Wingate indicators.	Aiming tripods.	Cleaning sticks (wooden).	Remington cleaning brushes.
On last annual return ...	4,640	90	53	81	596	570	148	148	1,193	312	81	28	200	69	334	15	....	.....
Purchased, received upon requisition, taken up, fabricated, etc.	.....	....	....	....	62	73	....	....	.....	....	....	....	....	....	....	....	175	1,050
Received from organizations of National Guard	192	....	....	16	....	....	....	....	17	....	....	....	....	....	10	....	....	.....
Total	4,382	90	53	97	658	643	148	148	1,210	312	81	28	200	69	344	15	175	1,050
Issued	419	....	....	....	....	....	....	....	50	....	....	....	20	....	....	....	175	1,050
Serviceable and unserviceable property on hand	4,413	90	53	97	658	643	148	148	1,160	312	81	28	180	69	344	15	....	. ....
Serviceable property on hand	4,281	....	....	....	....	....	....	....	1,129	....	....	....	180	....	....	....	....	.....
Unserviceable property on hand	132	90	53	97	658	643	148	148	31	312	81	28	....	69	344	15	....	.....
Unserviceable property sold, condemned, expended and destroyed	.....	....	....	....	....	....	....	....	6	....	....	....	....	....	....	....	....	.....
On hand to be accounted for, serviceable	4,281	....	....	....	....	....	....	....	1,129	....	....	....	180	....	....	....	....	.....
On hand to be accounted for, unserviceable	132	90	53	97	658	643	148	148	25	312	81	28	....	69	344	15	....	.....
Total on hand to be accounted for	4,413	90	53	97	658	643	148	148	1,154	312	81	28	180	69	344	15	....	.....

ABSTRACT B — *(Continued).*

	Remington screw drivers.	Reloading implements (sets of).	Sabres.	Non-commissioned officers' swords.	Non-com. officers' swords scabbards.	Dress.						Fatigue, Old Model.			
						Cross belts.	Cross belt plates.	Waist belts.	Waist belt plates.	Cartridge boxes.	Bayonet scabbards.	Waist belts.	Waist belt plates.	Cartridge boxes.	Bayonet scabbards.
On last annual return	390	....	387	134	34	2,792	698	853	863	1,984	1,889	2,273	884	2,362	1,961
Purchased, received upon requisition, taken up, fabricated, etc.	....	....	....	....	....	77	75	66	65	80	300	.....	.....	.....	.....
Received from organizations of National Guard	....	2	60	....	....	629	295	278	310	194	186	3,151	3,151	3,095	3,305
Total	390	2	447	134	34	3,498	1,068	1,197	1,238	2,258	2,375	5,539	3,995	5,457	5,266
Issued	....	....	....	...	....	.....	.....	.....	.....	.....	.....	-8	8	8	8
Serviceable and unserviceable property on hand	390	2	447	134	34	3,498	1,068	1,197	1,238	2,258	2,375	5,531	3,987	5,449	5,258
Serviceable property on hand	390	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unserviceable property on hand	....	2	447	134	34	3,498	1,068	1,197	1,238	2,258	2,375	5,531	3,987	5,449	5,258
Unserviceable property sold, condemned, expended and destroyed	....	....	93	....	....	2,742	720	780	905	2,093	2,276	.....	2,790	1,720	2,300
On hand to be accounted for, serviceable	390	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
On hand to be accounted for, unserviceable.	....	2	354	134	34	756	348	417	333	165	99	5,531	1,197	3,729	2,958
Total on hand to be accounted for	390	2	354	134	34	756	348	417	333	165	99	5,531	1,197	3,729	2,958

ABSTRACT B — *(Continued).*

	FATIGUE, NEW MODEL.																
	Waist belts.	Waist belt plates.	Cartridge boxes.	Bayonet scabbards.	Sabre belts.	Sabre belt plates.	Non-commissioned officers' sword belts.	Non-commissioned officers' sword frogs.	Band waist belts.	Band waist belt plates.	Cap pouches.	Band shoulder knots.	Sabre knots.	Gun slings.	Carbine slings.	Carbine swivels.	Pistol holsters.
On last annual return	830	830	1,830	830	2,012	1,944	11	11	25	24	90	54	385	2,059	353	...	200
Purchased, received upon requisition, taken up, fabricated, etc.	.....	.....	.....	.....	.....	.....	....	....	....	....	....	....	....	1,318	....	....	....
Received from organizations of National Guard.	9,000	9,000	8,000	9,000	98	98	...	....	....	....	....	....	47	662	18	12	2
Total	9,830	9,830	9,830	9,830	2,110	2,042	11	11	25	24	90	54	432	4,039	371	12	202
Issued	8,749	8,749	8,749	8,749	.....	.....	....	....	....	....	....	....	....	1,277	....	....	20
Serviceable and unserviceable property on hand	1,081	1,081	1,081	1,081	2,110	2,042	11	11	25	24	90	54	432	2,762	371	12	182
Serviceable property on hand	1,081	1,081	1,081	1,081	.....	.....	....	....	....	....	....	....	....	.....	....	....	180
Unserviceable property on hand	.....	.....	.....	.....	2,110	2,042	11	11	25	24	90	54	432	2,762	371	12	2
Unserviceable property sold, condemned, expended and destroyed	.....	.....	.....	.....	1,676	1,676	....	....	25	24	90	54	385	2,287	353	12	....
On hand to be accounted for, serviceable	1,081	1,081	1,081	1,081	.....	.....	....	....	....	....	....	....	....	.....	....	....	....
On hand to be accounted for, unserviceable	.....	.....	.....	.....	434	366	11	11	....	....	....	....	47	475	18	....	2
Total on hand to be accounted for	1,081	1,081	1,081	1,081	434	366	11	11	....	....	....	....	47	475	18	....	182

ABSTRACT B—*(Continued).*

	Knapsacks.	Haversacks.	Haversack pockets.	Canteens.	Canteen stoppers and chains.	Music pouches and slings.	Blankets, woolen.	Blankets, rubber.	Overcoats.	Blouses.	State service coats.	State service trousers.	Dress coats (old style).	Uniform trousers (old style).	Band coats.
On last annual return	5,095	2,003	....	3,208	....	27	3,602	144	3,288	944	208	300	1,796	993	28
Purchased, received upon requisition, taken up, fabricated, etc	.....	.....	12	.....	106	....	800	....	.....	.....	1,619	1,664	.....	.....	....
Received from organizations of National Guard	109	183	....	173	....	....	142	....	256	843	512	576	194	519	....
Total	5,204	2,386	12	3,381	106	27	4,544	144	3,544	1,837	2,339	2,531	1,990	1,512	28
Issued	187	584	12	334	106	....	132	....	815	65	1,620	1,663	.....	.....	....
Serviceable and unserviceable property on hand	5,017	1,802	....	3,047	....	27	4,412	144	2,729	1,772	719	868	1,990	1,512	28
Serviceable property on hand	.....	1,733	....	2,802	....	....	4,142	140	.....	.....	....	1	.....	.....	....
Unserviceable property on hand	5,017	69	....	245	....	27	270	4	2,729	1,772	719	867	1,990	1,512	28
Unserviceable property sold, condemned, expended and destroyed	2,742	69	....	245	....	27	286	4	2,321	934	719	452	1,124	509	28
On hand to be accounted for, serviceable	.....	.....	....	.....	....	....	.....	....	.....	838	.....	415	866	1,003	....
On hand to be accounted for, unserviceable	2,275	.....	....	.....	....	....	.....	....	408	.....	.....	.....	.....	.....	....
Total on hand to be accounted for	2,275	1,773	....	2,802	....	....	4,126	140	408	838	.....	416	866	1,003	....

ABSTRACT B—*(Continued).*

	Band trousers.	Fatigue jackets.	State service helmets.	Helmets (old style).	Band helmets.	Dress hats (old style).	State service forage caps.	Forage caps (old style).	Helmet plumes.	Helmet cords.	Helmet bags.	Pompons.	Epaulettes.	Leggins.	Shoes, pairs of.	National colors, silk.	State colors, silk.	Ordnance colors, silk.	Brigade colors, silk.	Garrison flags, bunting.
On last annual return	28	8	169	563	27	885	804	746	173	94	69	773	2,922	....	38	21	38	1	3	3
Purchased, received upon requisition, taken up, fabricated, etc.	....	....	1,329	....	....	....	1,477	....	66	66	....	....	....	....	....	2	1	....	1	....
Received from organizations of National Guard,	....	....	286	....	....	177	219	205	80	18	....	141	132	26	....	1	1	....	1	2
Total	28	8	1,784	563	27	1,062	2,500	951	319	178	69	914	3,054	26	38	24	40	1	5	5
Issued	....	....	1,335	....	....	....	1,476	....	66	66	....	....	....	....	....	1	....	....	2	....
Serviceable and unserviceable property on hand	28	8	449	563	27	1,062	1,024	951	253	112	69	914	3,054	26	38	23	40	1	3	5
Serviceable property on hand	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....
Unserviceable property on hand	28	8	449	563	27	1,062	1,024	951	253	112	69	914	3,054	26	38	22	39	1	3	5
Unserviceable property sold, condemned, expended and destroyed	28	8	150	563	27	882	765	951	253	112	....	140	2,725	....	38	....	....	....	....	....
On hand to be accounted for, serviceable	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....
On hand to be accounted for, unserviceable	....	....	299	....	....	180	259	....	....	....	....	774	329	26	....	22	39	1	3	5
Total on hand to be accounted for	....	....	299	....	....	180	259	....	....	....	69	774	329	26	....	23	40	1	3	5

ABSTRACT B — *(Continued).*

	State flags, bunting.	Storm flags, bunting.	National Guard flags, bunting.	Post flags, bunting.	Press flags, bunting.	Hospit'l flags, bunting.	Guidons, infantry.	Guidons, cavalry.	Guidons, artillery.	Markers.	Color staves.	Guidon staves.	Flag staffs with gilt balls.	Color cords with tassels.	Color sockets with slings or straps.	Guidon sockets with straps.	Gilt eagles.	Gilt pike heads.	Color covers.	Guidon and marker covers.	Marker staves.
On last annual return	3	1	2	1	1	1	30	14	11	54	55	30	2	16	16	2	30	....	8	....	....
Purchased, received upon requisition, taken up, fabricated, etc	1	1	....	8	....	....	10	....	3	16	3	7	....	3	2	2	2	1	3	12	8
Received from organizations of National Guard	....	....	....	....	....	....	2	....	3	....	....	1	....	....	1	2	....	....	....	....	....
Total	4	2	2	9	1	1	42	14	17	70	58	38	2	19	19	6	32	1	11	12	8
Issued	1	1	....	7	....	....	8	....	3	12	2	5	....	2	1	2	1	1	2	6	4
Serviceable and unserviceable property on hand	3	1	2	2	1	1	34	14	14	58	56	33	2	17	18	4	31	....	9	6	4
Serviceable property on hand	2	....	2	2	....	1	2	....	....	4	2	2	2	2	2	....	2	....	2	....	4
Unserviceable property on hand	1	1	....	....	1	....	32	14	14	54	54	31	....	15	16	4	29	....	7	....	....
Unserviceable property sold, condemned, expended and destroyed	....	....	....	....	....	....	....	....	....	....	....	....	....	....	16	....	....	....	....	....	....
On hand to be accounted for, serviceable	2	1	2	2	....	1	2	....	....	4	2	2	2	2	2	....	2	....	2	6	4
On hand to be accounted for, unserviceable	1	....	....	....	1	....	32	14	14	54	54	31	....	15	....	4	29	....	7	....	....
Total on hand to be accounted for	1	1	2	2	1	1	34	14	14	58	56	33	2	17	2	4	29	....	9	6	4

ABSTRACT B — *(Continued).*

	Signal Equipments.																						
	Incomplete sets.*	Canteens.	Flame shades.	Funnels.	Pliers.	Scissors.	Five gal. copper cans.	Flags.	Knapsacks.	Haversacks.	Three jointed poles.	Canvas covers.	Worms.	Torches.	Extinguishers.	Signal staves.	Lamp wick, balls of.	Bass drums.	Bass drum sticks.	Bass drum slings.	Bass drum heads.	Bass drum ropes.	Snare drums.
On last annual return	6	1	2	1	1	1	2	46	1	....	....	....	....	....	....	23	20	3	....	....	....	....	168
Purchased, received upon requisition, taken up, fabricated, etc	....	2	4	1	1	....	....	....	....	3	2	2	1	4	5	....	....	1	1	1	8	2	71
Received from organizations of National Guard	....	3	7	....	....	....	....	18	....	3	4	4	4	8	7	....	....	....	....	....	....	....	24
Total	6	6	13	2	2	1	2	64	1	6	6	6	5	12	12	23	20	4	1	1	8	2	263
Issued	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	8	2	71
Serviceable and unserviceable property on hand	2	6	13	2	2	1	2	64	1	6	6	6	5	12	12	23	20	3	....	....	....	....	192
Serviceable property on hand	....	6	13	2	2	....	2	64	1	6	6	6	5	12	12	23	20	....	....	....	....	....	.....
Unserviceable property on hand	2	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	192
Unserviceable property sold, condemned, expended and destroyed	2	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	20	3	....	....	....	....	169
On hand to be accounted for, serviceable	....	6	13	2	2	....	2	64	1	6	6	6	5	12	12	23	....	....	....	....	....	....	.....
On hand to be accounted for, unserviceable	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	..	....	....	....	....	....	....	23
Total on hand to be accounted for	....	6	13	2	2	....	2	64	1	6	6	6	5	12	12	23	....	....	....	....	....	....	23

*The above "sets" being incomplete were broken up and carried in parts.

ABSTRACT B — *(Continued).*

	Snare drum sticks.	Snare drum slings.	Snare drum covers.	Snare drum heads, batter.	Snare drum heads, snare.	Snare drum snares.	Snare drum ropes.	Snare drum braces.	Snare drum hooks.	Snare drum flesh hoops.	Snare drum band hoops.	Snare drum counter hoops.	Snare drum snare tighteners.	Snare drum shells.	Bugles.	Bugle cords with tassels.	Hospital tents.	Hospital tent flies.	Hospital tent poles, ridge.	Hospital tent poles, upright.	Wall tents
On last annual return	12	11	2	20	2	....	....	31	42	....	....	....	....	6	69	2	44	38	42	77	828
Purchased, received upon requisition, taken up, fabricated, etc	198	17	3	159	30	10	116	436	260	13	12	24	6	....	7	2	...	.....	.....	.....	.....
Received from organizations of National Guard,	93	49	....	2	....	....	....	....	....	....	....	....	....	8	4	....	....	.....	.....	.....	.....
Total	303	77	5	181	32	10	116	467	302	13	12	24	6	14	80	4	44	38	42	77	828
Issued	198	17	3	159	30	10	116	436	260	13	12	24	6	....	7	2	....	....	....	....	.....
Serviceable and unserviceable property on hand	105	60	2	22	2	....	....	31	42	....	....	....	....	14	73	2	44	38	42	77	828
Serviceable property on hand	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	43	38	42	77	827
Unserviceable property on hand	105	60	2	22	2	....	....	31	42	....	....	....	....	14	73	2	1	.....	.....	....	1
Unserviceable property sold, condemned, expended and destroyed	100	33	2	22	2	....	....	...	....	....	....	....	....	14	55	2	1	....	....	....	1
On hand to be accounted for, serviceable	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	43	38	42	77	827
On hand to be accounted for, unserviceable	5	27	....	....	....	....	....	31	42	....	....	....	....	....	18	....	....	....	....	....	.....
Total on hand to be accounted for	5	27	....	....	....	...	....	31	42	....	....	....	....	....	18	....	43	38	42	77	827

ABSTRACT B—*(Continued).*

	Wall tent flies.	Wall tent poles, ridge.	Wall tent poles, upright.	A tents.	A tent poles, ridge.	A tent poles, upright.	Tent pins.	Tent stakes.	Tent floors.	Mallets for driving stakes.	Iron target slabs.	Sentry boxes.	Bulletin boards.	Shovels.	Spades.	Hoes.	Felling axes.	Hay rakes (wooden).
On last annual return	683	742	1,321	375	300	600	17,940	12,280	513	5	....	18	13	68	28	45	22	154
Purchased, received upon requisition, taken up, fabricated, etc	....	....	.....	....	....	....	.....	.....	....	12	....	....	....	....	30	....	....	48
Received from organizations of National Guard	....	....	.....	....	....	....	.....	.....	....	....	11	....	....	4	....	....	14	.....
Total	683	742	1,321	375	300	600	17,940	12,280	513	17	11	18	13	72	58	45	36	202
Issued	....	....	.....	....	....	....	.....	.....	....	....	11	....	....	2	....	....	4	.....
Serviceable and unserviceable property on hand,	683	742	1,321	375	300	600	17,940	12.280	513	17	....	18	13	70	58	45	32	202
Serviceable property on hand	683	742	1,321	261	300	600	.....	.....	513	12	....	18	13	70	58	45	32	103
Unserviceable property on hand	....	....	.....	114	...	....	17,940	12,280	....	5	....	....	....	....	....	....	....	99
Unserviceable property sold, condemned, expended and destroyed	....	....	.....	114	....	....	8,000	2,000	....	5	....	....	....	4	3	....	10	99
On hand to be accounted for, serviceable	683	742	1.321	261	300	600	.....	.....	513	12	....	18	13	66	55	45	22	103
On hand to be accounted for, unserviceable	....	....	.....	....	....	....	9,940	10,280	....	....	....	....	....	....	....	....	....	.....
Total on hand to be accounted for	683	742	1,321	261	300	600	9,940	10,280	513	12	....	18	13	66	55	45	22	103

ABSTRACT B—*(Continued).*

	Iron rakes.	Scythe blades.	Scythe snathes.	Sickles.	Earth closet.	Uniform trunks.	Clothes racks.	Gun racks.	Sprinkling carts.	Water tank.	Iron water pipe (lot of).	Refrigerator.	Wash-tubs.	Wheelbarrows.	Hatchets.	Horse trough.	Knives.	Forks.	Meat saw.	Meat cleaver.	Butcher's steel.
On last annual return	9	4	8	12	1	7	63	200	2	1	1	1	18	43	5	1	2,090	2,219	1	1	4
Purchased, received upon requisition, taken up, fabricated, etc.	....	....	....	....	....	....	....	....	....	....	....	....	....	12	....	....	5	3	....	....	....
Received from organizations of National Guard	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	.....	....	....	....
Total	9	4	8	12	1	7	63	200	2	1	1	1	18	55	5	1	2,095	2,222	1	1	4
Issued	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	.....	....	....	....
Serviceable and unserviceable property on hand	9	4	8	12	1	7	63	200	2	1	1	1	18	55	5	1	2,095	2,222	1	1	4
Serviceable property on hand	9	4	8	12	1	7	63	200	2	1	1	1	18	53	5	....	969	1,237	1	1	4
Unserviceable property on hand	....	....	....	....	....	....	....	....	....	....	....	....	..	2	....	1	1,126	985	....	....	....
Unserviceable property sold, condemned, expended and destroyed	....	....	....	....	....	....	....	....	....	....	1	....	....	2	....	1	192	50	....	....	....
On hand to be accounted for, serviceable	9	4	8	12	1	7	63	200	2	1	....	1	18	53	5	....	969	1,237	1	1	4
On hand to be accounted for, unserviceable	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	934	935	....	....	....
Total on hand to be accounted for	9	4	8	12	1	7	63	200	2	1	....	1	18	53	5	....	1,903	2,172	1	1	4

ABSTRACT B—*(Continued).*

	Table spoons.	Tea spoons.	Large iron spoons.	Tin cups.	Tin plates.	Tin wash basins.	Camp kettles.	Water pails.	Knife pails.	Tin milk cans.	Bed cots.	Mattresses.	Hand lanterns.	Tubular lanterns.	Reflector lanterns.	Chandeliers.	Lamp burners.
On last annual return	6,945	500	8	9,000	9,448	4,200	100	962	62	1	992	....	399	34	27	2	....
Purchased, received upon requisition, taken up, fabricated, etc	.....	...	....	.....	.....	.....	....	600	..	....	200	800	150	62	....	....	24
Received from organization of National Guard	.....	....	....	.....	.....	.....	....	.....	....	....	.....	....	10	....	....	....	....
Total	6,945	500	8	9,000	9,448	4,200	100	1,562	62	1	1,192	800	559	96	27	2	24
Issued	.....	....	....	.....	.....	.....	....	.....	....	....	.....	....	....	....	....	....	....
Serviceable and unserviceable property on hand	6,945	500	8	9,000	9,448	4,200	100	1,562	62	1	1,192	800	559	96	27	2	24
Serviceable property on hand	6,870	500	5	8,373	9,398	3,921	100	1,338	59	1	1,010	....	124	84	21	2	24
Unserviceable property on hand	75	....	3	627	50	359	....	224	3	....	182	800	435	12	6	....	....
Unserviceable property sold, condemned, expended and destroyed	75	....	3	627	50	359	....	224	3	....	54	800	435	....	....	....	24
On hand to be accounted for, serviceable	6,870	500	5	8,373	9,398	3,921	100	1,338	59	1	1,010	....	124	84	21	2	....
On hand to be accounted for, unserviceable	.....	....	....	.....	.....	.....	....	.....	....	....	128	....	....	12	6	....	....
Total on hand to be accounted for	6,870	500	5	8,373	9,398	3,921	100	1,338	59	1	1,138	....	124	96	27	2	....

ABSTRACT B—*(Continued).*

	Lantern wicks.	Lantern globes.	Astral oil, galls.	Candle-sticks.	Candles, boxes of.	Long brooms.	Whisk brooms.	Range with boilers, etc.	Furnace and kettle.	Tin coffee pots.	Copper coffee urns.	Iron kettles, 70 galls.	Fish boilers.	Vegetable steamers.	Potato boilers.	Coffee kettles, 110 galls.	Water boilers.	Iron water coolers, 20 galls.	Graters.	Baskets.	Cullenders.
On last annual return	....	....	....	1,150	....	....	....	1	1	83	2	3	7	8	4	1	3	12	2	37	3
Purchased, received upon requisition, taken up, fabricated, etc.	720	24	400	576	100	600	6	....	....	....	....	2	....	....	....	....	....	....	....	48	...
Received from organizations of National Guard,	....	....	....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	720	24	400	1,726	100	600	6	1	1	83	2	5	7	8	4	1	3	12	2	85	3
Issued	....	....	....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Serviceable and unserviceable property on hand	720	24	400	1,726	100	600	6	1	1	83	2	5	7	8	4	1	3	12	2	85	3
Serviceable property on hand	720	24	400	1,172	100	600	6	1	1	49	2	5	7	4	4	1	2	12	2	79	2
Unserviceable property on hand	....	....	....	554	....	....	....	....	....	34	....	....	....	4	....	....	1	....	....	6	1
Unserviceable property sold, condemned, expended and destroyed	720	24	400	554	100	600	6	....	....	34	....	....	....	4	....	....	1	....	....	6	1
On hand to be accounted for, serviceable	...	....	....	1,172	....	....	....	1	1	49	2	5	7	4	4	1	2	12	2	79	2
On hand to be accounted for, unserviceable	....	....	....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total on hand to be accounted for	....	....	....	1,172	....	....	....	1	1	49	2	5	7	4	4	1	2	12	2	79	2

ABSTRACT B—*(Continued).*

	Dippers.	Tin coffee pails.	Skimmers.	Steam trap.	Pump and boiler (Worthington).	Pump (Dean).	Cooking range.	Dish pans.	Sauce pans.	Frying pans.	Baking pans.	Drip pans.	Potato mashers.	Surgical instruments (field cases).	Surgical instruments (pocket cases).	Hospital knapsacks.	Medical case.	Field stretchers.	Medical show case.	Hospital desk.	Hospital closet.	Dining tables, feet of.	Small tables.	Office tables.
On last annual return	9	56	3	1	1	1	1	9	2	14	12	5	1	8	19	11	1	3	1	1	1	470	90	1
Purchased, received upon requisition, taken up, fabricated, etc	....	20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Received from organizations of National Guard	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	9	76	3	1	1	1	1	9	2	14	12	5	1	8	19	11	1	3	1	1	1	470	90	1
Issued	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Serviceable and unserviceable property on hand	9	76	3	1	1	1	1	9	2	14	12	5	1	8	19	11	1	3	1	1	1	470	90	....
Serviceable property on hand	9	71	3	1	....	1	1	9	2	14	12	5	1	8	19	10	1	3	1	1	1	470	90	....
Unserviceable property on hand	....	5	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Unserviceable property sold, condemned, expended and destroyed	....	5	....	....	1	....	....	....	....	....	....	....	....	1	2	....	....	....	....	....	....	....	2	....
On hand to be accounted for, serviceable	9	71	3	1	....	1	1	9	2	14	12	5	1	7	17	10	1	3	1	1	1	470	88	....
On hand to be accounted for, unserviceable	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Total on hand to be accounted for	9	71	3	1	....	1	1	9	2	14	12	5	1	7	17	11	1	3	1	1	1	470	88	....

ABSTRACT B — *(Continued).*

	Center tables.	Wooden stools.	Camp stools.	Camp chairs.	Wooden chairs.	Steamer chairs.	Easy chairs.	Rocking chairs.	Desk chairs.	Office chairs.	Lounges.	Sofas.	Writing desks.	Book case and stand.	Cabinet.	Chamber set, 12 pieces.	Curtains.	Curtain poles.	Carpets.	Carpet crash.	Rugs.	Window shades.	Cuspadores.
On last annual return	....	1,053	1,518	6	20	6	....	....	1	9	....	....	2	2	....	....	....	....	....	....	....	12	...
Purchased, received upon requisition, taken up, fabricated, etc.	....	100	....	....	....	....	....	....	....	3	....	....	2	....	1	1	8	7	2	....	....	....	4
Received from organizations of National Guard,	2	....	6	....	....	....	5	1	2	12	1	1	1	1	....	....	....	....	....	1	1	....	...
Total	2	1,153	1,524	6	20	6	5	1	3	24	1	1	5	3	1	1	8	7	2	1	1	12	4
Issued	1	....	....	....	....	....	....	....	1	24	....	....	5	2	1	....	....	....	1	....	....	12	4
Serviceable and unserviceable property on hand,	1	1,153	1,524	6	20	6	5	1	2	....	1	1	....	1	....	1	8	7	1	1	1	....	...
Serviceable property on hand	1	968	1,260	6	20	6	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Unserviceable property on hand	....	185	254	....	....	....	5	1	....	....	1	1	....	1	....	1	8	7	1	1	1	....	...
Unserviceable property sold, condemned, expended and destroyed	....	....	264	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
On hand to be accounted for, serviceable	1	968	1,260	6	20	6	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	...
On hand to be accounted for, unserviceable	...	185	....	....	....	....	5	1	....	....	1	1	....	1	....	1	8	7	1	1	1	....	...
Total on hand to be accounted for	1	1,153	1,260	6	20	6	5	1	2	....	1	1	....	1	....	1	8	7	1	1	1	....	...

ABSTRACT B—*(Continued).*

	Looking glasses.	Wash-stands.	Umbrella stands.	Stoves.	Hat racks.	Letter press.	Hand stamp.	Black boards.	Ink stands.	Drop lights.	Scrap baskets.	Anvils.	Pincers.	Tongs.	Punches.	Mattocks.	Breast knives.	Jack screws.	Claw-bars.	Crow-bars.	Bill hooks.	Sledge hammers.	Hand hammers.	Swabs.
On last annual return	....	....	....	1	....	1	1	....	....	1	....	3	6	11	4	4	2	3	2	2	2	2	2	2
Purchased, received upon requisition, taken up, fabricated, etc	1	....	....	....	1	....	....	1	1	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....
Received from organizations of National Guard	1	1	1	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	2	1	1	1	1	2	1	1	1	1	2	3	6	11	4	4	2	3	2	2	2	2	2	2
Issued	1	....	....	....	1	....	....	1	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....
Serviceable and unserviceable prop'rty on hand	1	1	1	1	....	2	1	....	....	....	....	3	6	11	4	4	2	3	2	2	2	2	2	2
Serviceable property on hand	....	....	....	....	....	....	....	....	....	....	....	3	6	11	4	4	2	3	2	2	2	2	2	2
Unserviceable property on hand	1	1	1	1	....	2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Unserviceable property sold, condemned, expended and destroyed	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
On hand to be accounted for, serviceable	....	....	....	....	....	....	....	....	....	....	....	3	6	11	4	4	2	3	2	2	2	2	2	2
On hand to be accounted for, unserviceable	1	1	1	1	....	2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total on hand to be accounted for	1	1	1	1	....	2	1	....	....	....	....	3	6	11	4	4	2	3	2	2	2	2	2	2

ABSTRACT B — *(Continued).*

	Flatters.	Forge shovels.	Cold chisels.	Fullers.	Creasers.	Nail sets, blacksmiths.	Brad awls.	Machinists' lathe.	Emery lathes.	Drilling machine.	Screw-drivers.	Riveting hammers.	Claw hammers.	Gouges.	Braces.	Bits, assorted.	Chisels.	Gauges.	Cross-cut saws.	Rip saws.	Keyhole saws.	Panel saws.	Buck saws.	Saw sets, carpenters.
On last annual return	2	3	12	4	2	5	3	1	2	1	3	1	3	3	2	12	6	1	2	2	1	1	1	1
Purchased, received upon requisition, taken up, fabricated, etc.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Received from organizations of National Guard	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	2	3	12	4	2	5	3	1	2	1	3	1	3	3	2	12	6	1	2	2	1	1	1	1
Issued	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Serviceable and unserviceable property on hand	2	3	12	4	2	5	3	1	2	1	3	1	3	3	2	12	6	1	2	2	1	1	1	1
Serviceable property on hand	2	3	12	4	2	5	5	1	....	1	3	1	3	3	1	11	6	1	2	2	1	1	1	1
Unserviceable property on hand	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....
Unserviceable property sold, condemned, expended and destroyed	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....
On hand to be accounted for, serviceable	2	3	12	4	2	5	5	1	....	1	3	1	3	3	1	11	6	1	2	2	1	1	1	1
On hand to be accounted for, unserviceable	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total on hand to be accounted for	2	3	12	4	2	5	5	1	2	1	3	1	3	3	1	1	6	1	2	2	1	1	1	1

ABSTRACT B — *(Continued).*

	Nail sets.	Jointing planes.	Smoothing planes.	Jack planes.	Plough planes and irons.	Taps and dies.	Tap wrenches.	Files, assorted.	Drawing knives.	Bevels.	Glue pots.	Oil cans.	Spirit levels.	Rules, 2 feet.	Chalk lines.	Bronz axes.	Steel squares.	Panel squares.	Dividers.	Hand-screws.	Plyers.	Carpenters' mallets.	Monkey wrenches.	Grindstones.
On last annual return	2	1	1	1	1	1	1	7	1	1	1	2	1	1	1	2	1	1	1	4	1	1	2	1
Purchased, received upon requisition, taken up, fabricated, etc.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Received from organizations of National Guard	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	2	1	1	1	1	1	1	7	1	1	1	2	1	1	1	2	1	1	1	4	1	1	2	1
Issued	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Serviceable and unserviceable property on hand	2	1	1	1	1	1	1	7	1	1	1	2	1	1	1	2	1	1	1	4	1	1	2	1
Serviceable property on hand	2	1	1	1	1	1	1	6	1	1	1	2	....	1	....	2	1	1	1	4	1	1	2	1
Unserviceable property on hand	....	....	....	....	....	....	....	1	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....
Unserviceable property sold, condemned, expended and destroyed	....	....	....	....	....	....	....	1	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....
On hand to be accounted for, serviceable	2	1	1	1	1	1	1	6	1	1	1	2	....	1	....	2	1	1	1	4	1	1	2	1
On hand to be accounted for, unserviceable	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total on hand to be accounted for	2	1	1	1	1	1	1	6	1	1	1	2	....	1	....	2	1	1	1	4	1	1	2	1

ABSTRACT B—*(Continued).*

	Armorers' lathe.	Vises.	Vise bench.	Marking pot and brushes.	Nail dog.	Scrapers.	Step ladders.	Rung ladders.	Fire extinguishers.	Ex. charges, fire extinguishers.	Platform trucks.	Hand trucks.	Platform scales.	Counter scales.	Rubber hose, feet of.	Ordnance stamp, [S. N. Y.]	Metallic tape measure.
On last annual return	1	3	1	1	1	1	2	2	2	4	1	4	1	1	200	1	1
Purchased, received upon requisition, taken up, fabricated, etc	....	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Received from organizations of National Guard	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Total	1	3	1	1	1	1	2	2	2	4	1	4	1	1	200	1	1
Issued	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Serviceable and unserviceable property on hand	1	3	1	1	1	1	2	2	2	4	1	4	1	1	200	1	1
Serviceable property on hand	1	2	1	1	1	1	2	2	2	4	1	4	1	1	150	1	...
Unserviceable property on hand	1	1	....	....	....	....	....	....	....	....	....	....	....	....	50	....	1
Unserviceable property sold, condemned, expended and destroyed	1	1	....	....	....	....	....	....	....	4	....	....	....	....	50	....	1
On hand to be accounted for, serviceable	....	2	1	1	1	1	2	2	2	....	1	4	1	1	150	1	...
On hand to be accounted for, unserviceable	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Total on hand to be accounted for	....	1	1	1	1	1	2	2	2	....	1	4	1	1	150	1	...

ABSTRACT C.

Military property of the State of New York issued to organizations of the National Guard, S. N. Y., and State Officers during the year ending September 30, 1887.

	Mountain howitzers, 12 pounder.	Napoleon guns, 12 pounder.	Quadrants.	Gunners' calipers.	Lifting jacks.	Gatling guns, cal. 50.	Gun carriages.	Caissons	Limbers.	Pendulum hausse and pouches.	Leg guards.	Spare wheels.	Spare poles.	Tompions and straps.	Trail handspikes.	Sponges.	Sponge covers.	Watering buckets.	Vent covers.	Pole pads.	Tarpaulins.	Priming wires.	Thumbstalls.	Gunners' gimlets.
Executive Mansion, Albany, N. Y.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
General Inspector of Rifle Practice	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Regiment	2	....	....	....	....	....	2	....	2	....	....	....	....	2	....	....	....	....	2	....	....	8	8	1
Eighth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ninth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tenth Battalion	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eleventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twelfth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirteenth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourteenth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-second Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-third Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-second Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Forty-seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixty-fifth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixty-ninth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventy-first Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventy-fourth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Third Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fifth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

| | | |

ABSTRACT C—*(Continued).*

	Pickaxes.	Fuse gauges.	Vent punches.	Hooks and lanyards.	Rammers and staves.	Rammers and sponges.	Tube pouches and belts.	Sponge buckets.	Tar buckets.	Cushions for limber chests.	Sponge heads.	Sponge and rammer staves.	Pole straps.	Prolongs.	Harness sets, two-horse lead.	Harness sets, two-horse wheel.	Gunners' haversacks.	Worms and staves.	Drag ropes.	Screw wrenches.	Bridles.	Bridle bits.	Nose bags.	Drivers' whips.
Executive Mansion, Albany, N. Y	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
General Inspector of Rifle Practice	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Regiment	....	....	....	4	....	4	4	2	....	....	....	....	....	2	....	....	2	1	4	....	....	....	....	....
Eighth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ninth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tenth Battalion	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eleventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twelfth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirteenth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourteenth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-second Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-third Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-second Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Forty-seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixty-fifth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....
Sixty-ninth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventy-first Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventy-fourth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Third Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fifth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eighth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ninth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eleventh Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Twelfth Separate Company																									
Fourteenth Separate Company																									
Fifteenth Separate Company																									
Sixteenth Separate Company																									
Seventeenth Separate Company																									
Eighteenth Separate Company																									
Nineteenth Separate Company																									
Twentieth Separate Company																									
Twenty-first Separate Company																									
Twenty-second Separate Company																									
Twenty-third Separate Company																									
Twenty-fourth Separate Company																									
Twenty-fifth Separate Company																									
Twenty-sixth Separate Company																									
Twenty-seventh Separate Company																									
Twenty-eighth Separate Company																									
Twenty-ninth Separate Company																									
Thirtieth Separate Company																									
Thirty-first Separate Company																									
Thirty-second Separate Company																									
Thirty-third Separate Company																									
Thirty-fourth Separate Company																									
Thirty-fifth Separate Company					2		1	1										1	1	1					
Thirty-sixth Separate Company																									
Thirty-seventh Separate Company																									
Thirty-eighth Separate Company																									
Thirty-ninth Separate Company																									
Fortieth Separate Company																									
Forty-first Separate Company																									
Forty-second Separate Company																									
Forty-third Separate Company																									
First Battery				4	2							2						1						5	
Second Battery	2	2	2	4		4	4	2	4	6			8	2	4	4	4			1			16	8	
Third Battery																									
Fifth Battery																									
Sixth Battery			2	8							4														
National Rifle Association																									
First Provisional Battalion (State Camp)																									
Second Provisional Battalion (State Camp)																									
Total	2	2	4	20	4	4	9	5	4	6	4	2	8	4	4	4	7	3	5	1	1	1	16	13	

ABSTRACT C—*(Continued).*

	Martingales and collars.	Saddles.	Spurs.	Spur straps.	Saddle cloths.	Halters.	Sponge stave straps.	Drag rope straps.	Handspike straps.	Gun slings for mountain howitzers.	Blank cannon cartridges.	Friction primers.	Metallic ball cartridges (50-70).	Blank metallic cartridges (cal. 50).	Remington B. L. rifles (cal 50).	Remington bayonets.	Remington carbines (cal 50).	Colts revolvers (cal. 45).	Pistol holsters.
Executive Mansion, Albany, N. Y.	....	....	....	....	....	....	....	....	....	....	....	.....	.....	.....	....	....	....	....	....
General Inspector of Rifle Practice	....	....	....	....	....	....	....	....	....	....	....	.....	40,000	.....	....	....	....	....	....
First Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	.....	520	.....	1	....	....	....	....
Second Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	.....	480	.....	....	....	....	....	....
Fourth Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	.....	12,500	.....	....	....	....	....	....
Seventh Regiment	....	....	....	....	....	....	12	12	8	4	....	.....	49,600	12,960	10	....	....	....	....
Eighth Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	33,960	.....	....	....	....	....	....
Ninth Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	21,440	7,000	....	....	....	....	....
Tenth Battalion	....	....	....	....	....	....	....	....	....	....	....	.....	.....	4,000	....	....	....	....	....
Eleventh Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	18,000	.....	....	....	....	....	....
Twelfth Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	26,480	12,220	100	100	....	....	....
Thirteenth Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	27,720	.....	....	....	....	....	....
Fourteenth Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	20,680	.....	....	....	....	....	....
Twenty-second Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	15,000	26,000	....	....	....	....	....
Twenty-third Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	37,160	10,400	....	....	....	....	....
Thirty-second Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	16,840	.....	....	....	....	....	....
Forty-seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	17,520	5,980	....	....	....	....	....
Sixty-fifth Regiment	1	1	....	....	1	....	....	....	....	....	....	.....	18,560	.....	....	....	....	....	....
Sixty-ninth Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	35,880	.....	100	100	....	....	....
Seventy-first Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	20,640	6,000	....	....	....	....	....
Seventy-fourth Regiment	....	....	....	....	....	....	....	....	....	....	....	.....	14,440	.....	25	25	....	....	....
First Separate Company	....	....	....	....	....	....	....	....	....	....	....	.....	2,400	.....	....	....	....	....	....
Second Separate Company	....	....	....	....	....	....	....	....	....	....	....	.....	3,640	.....	....	....	....	....	....
Third Separate Company	....	....	....	....	....	....	....	....	....	....	....	.....	4,400	.....	....	....	....	....	....
Fourth Separate Company	....	....	....	....	....	....	....	....	....	....	....	.....	2,880	.....	10	10	....	....	....
Fifth Separate Company	....	....	....	....	....	....	....	....	....	....	....	.....	4,400	.....	....	....	....	....	....
Sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	.....	4,000	.....	....	....	....	....	....
Seventh Separate Company	....	....	....	....	....	....	....	....	....	....	....	.....	3,080	.....	....	....	....	....	....
Eighth Separate Company	....	....	....	....	....	....	....	....	....	....	....	.....	2,680	.....	....	....	....	....	....
Ninth Separate Company	....	....	....	....	....	....	....	....	....	....	....	.....	1,520	.....	....	....	....	....	....
Tenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	.....	4,726	.....	....	....	....	....	....
Eleventh Separate Company	....	....	....	....	....	....	....	....	....	....	....	.....	2,200	.....	....	....	....	....	....
Twelfth Separate Company	....	....	....	....	....	....	....	....	....	....	....	.....	4,000	.....	....	....	....	....	....

Fourteenth Separate Company													2,640						
Fifteenth Separate Company													4,400						
Sixteenth Separate Company													2,280						
Seventeenth Separate Company													2,200						
Eighteenth Separate Company													2,880						
Nineteenth Separate Company													7,680						
Twentieth Separate Company													5,520	3,000					
Twenty-first Separate Company													2,000						
Twenty-second Separate Company													6,080						
Twenty-third Separate Company													2,560						
Twenty-fourth Separate Company															75	75			
Twenty-fifth Separate Company																			
Twenty-sixth Separate Company													4,000						
Twenty-seventh Separate Company													9,290						
Twenty-eighth Separate Company																			
Twenty-ninth Separate Company																			
Thirtieth Separate Company													2,880						
Thirty-first Separate Company													2,960						
Thirty-second Separate Company																			
Thirty-third Separate Company													2,520						
Thirty-fourth Separate Company													2,200						
Thirty-fifth Separate Company													5,160		13	13			
Thirty-sixth Separate Company													2,360						
Thirty-seventh Separate Company													2,000						
Thirty-eighth Separate Company													2,500		8	8			
Thirty-ninth Separate Company													3,320		23	23			
Fortieth Separate Company													2,160		5				
Forty-first Separate Company																			
Forty-second Separate Company													6,120						
Forty-third Separate Company													2,400		65	65			
First Battery			6	6	9							2,000	1,000				50		
Second Battery						16								10,000					
Third Battery																		20	20
Fifth Battery												1,000							
Sixth Battery											350	2,000	2,000	5,000					
National Rifle Association																			
First Provisional Battalion (State Camp)														4,300					
Second Provisional Battalion (State Camp)														5,040					
Total	1	1	6	6	10	16	12	12	8	4	350	5,000	558,456	109,200	435	419	50	20	20

ABSTRACT C — *(Continued).*

	Cleaning sticks (wooden).	Remington cleaning brushes.	Fatigue, Old Model.				Fatigue, New Model.				Gun slings.	Knapsacks.	Haversacks.	Canteens.	Canteen stoppers and chains.	Haversack pockets.
			Waist belts.	Waist belt plates.	Cartridge boxes.	Bayonet scabbards.	Waist belts.	Waist belt plates.	Cartridge-boxes.	Bayonet scabbards.						
Executive Mansion, Albany, N. Y.	....	.....	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....
General Inspector of Rifle Practice	....	.....	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....
First Brigade Staff	....	.....	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....
Second Brigade Staff	....	.....	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....
Fourth Brigade Staff	....	.....	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....
Seventh Regiment	....	500	....	....	....	....	1,000	1,000	1,000	1,000	800	....	....	....	....	....
Eighth Regiment	....	.....	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....
Ninth Regiment	100	.....	....	....	....	....	400	400	400	400	.....	....	....	....	....	....
Tenth Battalion	100	60	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....
Eleventh Regiment	....	.....	....	....	....	....	425	425	425	425	.....	....	....	....	....	....
Twelfth Regiment	....	400	....	....	....	....	700	700	700	700	100	....	150	150	....	....
Thirteenth Regiment	....	.....	....	....	....	....	550	550	550	550	.....	....	....	....	....	....
Fourteenth Regiment	....	.....	....	....	....	....	520	520	520	520	.....	....	....	....	....	....
Twenty-second Regiment	....	100	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....
Twenty-third Regiment	....	.....	....	....	....	....	700	700	700	700	.....	....	....	....	....	....
Thirty-second Regiment	....	.....	....	....	....	....	438	438	438	438	.....	....	....	....	....	....
Forty-seventh Regiment	....	.....	....	....	....	....	425	425	425	425	.....	....	....	....	....	....
Sixty-fifth Regiment	....	.....	....	....	....	....	445	445	445	445	40	....	....	....	....	....
Sixty-ninth Regiment	....	.....	....	....	....	....	919	919	919	919	.....	....	250	....	....	....
Seventy-first Regiment	50	50	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....
Seventy-fourth Regiment	....	.....	....	....	....	....	400	400	400	400	.....	....	....	....	....	....
First Separate Company	....	.....	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....
Second Separate Company	....	.....	....	....	....	....	100	100	100	100	.....	....	....	....	....	....
Third Separate Company	....	.....	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....
Fourth Separate Company	....	.....	....	....	....	....	70	70	70	70	10	10	10	10	....	....
Fifth Separate Company	....	.....	....	....	....	....	72	72	72	72	.....	12	6	6	....	....
Sixth Separate Company	....	.....	....	....	....	....	100	100	100	100	3	....	....	....	36	....
Seventh Separate Company	....	.....	....	....	....	....	75	75	75	75	.....	....	....	....	....	....
Eighth Separate Company		.....	....	....	....	....	75	75	75	75	.....	....	....	....	....	....
Ninth Separate Company	....	.....	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....
Tenth Separate Company	....	.....	....	....	....	....	50	50	50	50	.....	....	....	....	....	....
Eleventh Separate Company	....	.....	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....

Twelfth Separate Company																
Fourteenth Separate Company																
Fifteenth Separate Company																
Sixteenth Separate Company																
Seventeenth Separate Company							54	54	54	54						
Eighteenth Separate Company																
Nineteenth Separate Company							100	100	100	100						
Twentieth Separate Company							75	75	75	75						
Twenty-first Separate Company																
Twenty-Second Separate Company							80	80	80	80						
Twenty-third Separate Company							75	75	75	75						
Twenty-fourth Separate Company							75	75	75	75	75	75	75	75		
Twenty-fifth Separate Company																
Twenty-Sixth Separate Company							98	98	98	98						
Twenty-seventh Separate Company																
Twenty-eighth Separate Company											59					
Twenty-ninth Separate Company																
Thirtieth Separate Company							75	75	75	75						
Thirty-first Separate Company																
Thirty-second Separate Company							75	75	75	75						
Thirty-third Separate Company							70	70	70	70						
Thirty-fourth Separate Company																
Thirty-fifth Separate Company							13	13	13	13	19	13	13	13		
Thirty-sixth Separate Company							60	60	60	60						
Thirty-Seventh Separate Company							68	68	68	68						
Thirty-eighth Separate Company			8	8	8	8	64	64	64	64	8	8	8	8		
Thirty-ninth Separate Company							98	98	98	98	98					
Fortieth Separate Company												4				
Forty-first Separate Company							70	70	70	70						
Forty-second Separate Company																
Forty-third Separate Company							65	65	65	65	65	65	65	65		
First Battery																
Second Battery													25	25		
Third Battery																
Fifth Battery																
Sixth Battery							70	70	70	70					70	12
National Rifle Association																
First Provisional Battalion (State Camp)																
Second Provisional Battalion (State Camp)																
Total	250	1,110	8	8	8	8	8,749	8,749	8,749	8,749	1,277	187	601	352	106	12

ABSTRACT C—*(Continued).*

	Overcoats.	State service coats.	State service trousers.	State service helmets.	State service forage caps.	Helmet plumes.	Helmet cords.	Blouses.	Blankets, woolen.	National colors, silk.	Brigade colors, silk.	Storm flags, bunting	Post flags, bunting.	State flags, bunting.	Infantry guidons, silk.	Artillery guidons, silk.	Markers, silk.	Color cords and tassels.	Color sockets and slings.	Guidon sockets and straps.	Color staves.
Executive Mansion, Albany, N. Y	....	.....	.....	.....	.....	....	....	....	....	....	....	..	1	1	....	....	....	....	....	....	....
General Inspector of Rifle Practice	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Brigade Staff	....	.....	.....	.....	.....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....
Second Brigade Staff	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Brigade Staff	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Regiment	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eighth Regiment	....	78	80	89	85	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Ninth Regiment	50	101	101	96	96	....	....	....	....	1	....	....	....	....	2	....	4	1	....	....	1
Tenth Battalion	....	70	70	2	48	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eleventh Regiment	....	93	75	98	98	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Twelfth Regiment	75	142	143	134	134	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirteenth Regiment	....	52	52	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourteenth Regiment	....	9	8	59	59	....	....	....	....	....	....	....	....	....	2	....	4	....	....	....	....
Twenty-second Regiment	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....
Twenty-third Regiment	....	88	98	78	78	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-second Regiment	....	45	47	57	57	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Forty-seventh Regiment	....	70	70	74	76	....	....	....	....	....	....	....	....	....	2	....	4	....	....	....	....
Sixty-fifth Regiment	....	2	1	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixty-ninth Regiment	469	273	276	119	119	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventy-first Regiment	....	102	102	91	91	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventy-fourth Regiment	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Separate Company	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Separate Company	....	3	3	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Third Separate Company	....	26	26	26	26	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Fourth Separate Company	10	15	15	15	15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fifth Separate Company	12	31	31	35	35	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixth Separate Company	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Separate Company	....	2	2	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eighth Separate Company	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ninth Separate Company	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tenth Separate Company	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eleventh Separate Company	....	4	4	5	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Twelfth Separate Company	....	.....	.....	.....	.....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Fourteenth Separate Company	....	12	12	12	12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fifteenth Separate Company	....	6	6	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixteenth Separate Company	....	1	1	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventeenth Separate Company	15	10	10	6	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eighteenth Separate Company	....	3	3	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Nineteenth Separate Company	....	15	35	5	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twentieth Separate Company	....	9	9	7	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-first Separate Company	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-second Separate Company	....	.....	.....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-third Separate Company	....	4	4	4	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-fourth Separate Company	....	60	60	60	60	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-fifth Separate Company	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-sixth Separate Company	....	2	2	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-seventh Separate Company	....	9	9	9	9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-eighth Separate Company	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-ninth Separate Company	....	3	3	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirtieth Separate Company	....	5	5	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-first Separate Company	....	.....	.....	7	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-second Separate Company	....	.....	.....	4	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-third Separate Company	.....	10	10	11	11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-fourth Separate Company	....	7	7	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-fifth Separate Company	13	4	4	19	19	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-sixth Separate Company	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-seventh Separate Company	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-eighth Separate Company	8	15	15	15	15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-ninth Separate Company	....	22	22	24	24	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fortieth Separate Company	41	5	5	11	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Forty-first Separate Company	....	8	13	.....	71	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Forty-second Separate Company	....	17	17	10	10	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Forty-third Separate Company	65	66	66	74	74	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Battery	15	7	7	8	8	8	8	....	32	....	....	....	1	....	....	1	....	....	....	....	....
Second Battery	42	43	43	54	54	54	54	....	100	....	....	....	....	....	....	1	....	....	....	....	....
Third Battery	....	11	11	4	4	4	4	65	....	....	....	....	....	....	....	....	....	....	....	....	....
Fifth Battery	....	.....	.....	.....	.....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Sixth Battery	....	5	5	4	4	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
National Rifle Association	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Provisional Battalion (State Camp)	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Provisional Battalion (State Camp)	....	.....	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	815	1,565	1,588	1,325	1,439	66	66	65	132	1	1	1	7	1	6	3	12	1	1	2	1

ABSTRACT C—*(Continued).*

	Guidon staves.	Marker staves.	Gilt eagles.	Gilt pike heads.	Color covers.	Guidon and marker covers.	Signal equipments, sets of.	Bass drums.	Bass drum sticks.	Bass drum slings.	Bass drum heads.	Bass drum ropes.	Snare drums.	Snare drum sticks.	Snare drum slings.	Snare drum covers.	Snare drum heads, batter.	Snare drum heads, snare.	Snare drum snares.	Snare drum ropes.	Snare drum braces.	Snare drum hooks.	Snare drum flesh hoops.
Executive Mansion, Albany, N. Y.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
General Inspector of Rifle Practice	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Brigade Staff	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eighth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	32	....	....	16	....	....	16	....	160	....
Ninth Regiment	2	4	....	1	1	6	....	....	....	....	2	....	....	40	....	....	20	20	....	20	....	....	....
Tenth Battalion	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eleventh Regiment	....	....	....	....	....	....	....	1	....	1	....	....	20	48	....	....	....	24	....	24	72	....	....
Twelfth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirteenth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourteenth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-second Regiment	2	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	40	....	....	....	240	....	....
Twenty-third Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	....	....	....
Thirty-second Regiment	....	....	....	....	....	....	....	....	....	....	....	....	20	....	....	....	....	....	....	....	....	....	....
Forty-seventh Regiment	....	....	....	....	....	....	....	....	....	....	2	....	....	20	....	....	....	....	....	....	100	100	....
Sixty-fifth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	12	6	....	6	6	....	6	....	....	....
Sixty-ninth Regiment	....	....	....	....	....	....	....	....	....	....	2	....	20	....	....	....	20	....	....	....	....	....	....
Seventy-first Regiment	....	....	....	....	....	....	....	....	1	....	2	2	....	20	....	....	10	....	....	10	....	....	....
Seventy-fourth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	18	16	8	....	....	....	10	20	24	....	12
First Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Third Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....	....	....
Fifth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eighth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ninth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eleventh Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	2	....	....	1

Twelveth Separate Company																								
Fourteenth Separate Company																								
Fifteenth Separate Company																								
Sixteenth Separate Company														2										
Seventeenth Separate Company																								
Eighteenth Separate Company																								
Nineteenth Separate Company																	6			6				
Twentieth Separate Company																								
Twenty-first Separate Company																								
Twenty-second Separate Company																								
Twenty-third Separate Company																								
Twenty-fourth Separate Company													1	2	1	1								
Twenty-fifth Separate Company																	8							
Twenty-sixth Separate Company																								
Twenty-seventh Separate Company																	2	2						
Twenty-eighth Separate Company																								
Twenty-ninth Separate Company																								
Thirtieth Separate Company																								
Thirty-first Separate Company																								
Thirty-second Separate Company																								
Thirty-third Separate Company														2				1						
Thirty-fourth Separate Company																								
Thirty-fifth Separate Company																								
Thirty-sixth Separate Company																								
Thirty-seventh Separate Company																								
Thirty-eighth Separate Company																								
Thirty-ninth Separate Company																								
Fortieth Separate Company																								
Forty-first Separate Company																								
Forty-second Separate Company																								
Forty-third Separate Company													2	4	2	2								
First Battery																								
Second Battery	1																							
Third Battery																								
Fifth Battery																								
Sixth Battery																								
National Rifle Association																								
First Provisional Battalion (State Camp)																								
Second Provisional Battalion (State Camp)																								
Total	5	4	1	1	1	6	4	1	1	1	8	2	81	198	17	3	133	55	10	114	436	260	13	

ABSTRACT C — *(Concluded).*

	Snare drum band hoops.	Snare drum counter hoops.	Snare drum snare tightenere.	Bugles.	Bugle cords and tassels.	Shovels.	Felling axes.	Iron target slabs.	Writing desks.	Office tables.	Center table.	Book case and stand.	Window shades.	Desk chairs.	Office chairs.	Drop lights.	Cabinets.	Cuspadors.	Carpets.	Looking glasses.	Black-boards.	Ink stands.	Hat racks.	Scrap baskets.	Arm chests.	Packing cases.
Executive Mansion, Albany, N. Y.	....	....	....	....	....	....	....	....	3	....	....	1	12	1	12	1	1	4	1	1	....	1	1	2	....	14
General Inspector of Rifle Practice	....	....	....	....	....	....	....	....	....	1	1	1	....	....	12	....	....	....	....	....	....	....	....	....	....	1
First Brigade Staff	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	8
Second Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Brigade Staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9
Seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	17
Eighth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Ninth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tenth Battalion	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7
Eleventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twelfth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	11
Thirteenth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6
Fourteenth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Twenty-second Regiment	....	24	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7
Twenty-third Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	21
Thirty-second Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Forty-seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7
Sixty-fifth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixty-ninth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Seventy-first Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Seventy-fourth Regiment	....	12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7
First Separate Company	....	....	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Third Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Fourth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Fifth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Seventh Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eighth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Ninth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Tenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eleventh Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Twelfth Separate Company	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Fourteenth Separate Company																										
Fifteenth Separate Company																										
Sixteenth Separate Company																										
Seventeenth Separate Company																										1
Eighteenth Separate Company																										
Nineteenth Separate Company																										2
Twentieth Separate Company																										1
Twenty-first Separate Company																										
Twenty-second Separate Company																										1
Twenty-third Separate Company																										1
Twenty-fourth Separate Company				1																					3	7
Twenty-fifth Separate Company				2																						
Twenty-sixth Separate Company																										1
Twenty-seventh Separate Company																										
Twenty-eighth Separate Company																										
Twenty-ninth Separate Company																										
Thirtieth Separate Company																										1
Thirty-first Separate Company																										
Thirty-second Separate Company				1	1																					1
Thirty-third Separate Company																										
Thirty-fourth Separate Company																										
Thirty-fifth Separate Company																									1	1
Thirty-sixth Separate Company																										1
Thirty-seventh Separate Company																										1
Thirty-eighth Separate Company																									1	3
Thirty-ninth Separate Company																										
Fortieth Separate Company																									1	1
Forty-first Separate Company																										1
Forty-second Separate Company																									3	5
Forty-third Separate Company																										4
First Battery				2		2	4																			8
Second Battery																										3
Third Battery																										
Fifth Battery																										2
Sixth Battery																										
National Rifle Association								11																		
First Provisional Battalion (State Camp)																										
Second Provisional Battalion (State Camp)																										
Total	12	24	6	7	2	2	4	11	5	1	1	2	12	1	24	1	1	4	1	1	1	1	1	2	17	167

ABSTRACT D.

Military property of the State of New York received from organizations of the National Guard, S. N. Y., for year -ending September 30, 1887.

	12-pdr. field howitzer.	Mt. howitzer, 12-pdr.	Steel guns, 3-inch.	Gatling guns, cal. 50.	Gun carriages.	Caissons.	Limbers.	Pendulum, hausse and pouches.	Leg guards.	Spare wheels.	Spare poles.	Tompions and straps.	Trail handspikes.	Sponges.	Sponge covers.	Watering buckets.	Vent covers.	Tarpaulins.	Priming wires.	Thumbstalls.	Gunners' gimlets.	Pickaxes.	Vent punches.	Hooks and Lanyards.
First Brigade staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ninth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tenth Battalion	....	....	....	1	1	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Eleventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twelfth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirteenth Regiment	....	2	....	....	2	....	2	....	....	....	....	2	....	....	....	....	2	....	4	....	1	....	....	4
Twenty-third Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-second Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Forty-seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixty-fifth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventy-fourth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fifth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirteenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixteenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventeenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eighteenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Nineteenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twentieth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-third Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-fourth Separate Company (disbanded)	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-third Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Forty-first Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Third Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Battery	4	....	....	....	4	4	4	4	8	4	4	4	11	2	4	12	....	8	12	....	1	4	4	....
Sixth Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....
Seventh Battery (disbanded)	....	....	4	1	1	....	5	....	....	....	....	....	8	7	....	....	....	....	....	1	....	....	....	1
Late Fourth Division	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Late Sixth Brigade	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Late Eighth Brigade	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Albany Burgesses Corps	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	4	2	4	2	8	4	12	4	8	4	5	6	19	9	4	12	6	8	16	1	2	4	4	5

ABSTRACT D— *(Continued).*

	Hammers and staves.	Tube pouches and belts.	Sponge buckets.	Tar buckets.	Prolonges.	Harness, sets, 2-horse lead.	Harness, sets, 2-horse wheel.	Gunner's haversacks.	Worms and staves.	Drag ropes.	Worms.	Screw wrench.	Gatling gun feed cases.	Gatling gun feed case pouches.	Bridles.	Bridle bits.	Nosebags.	Stirrups.	Stirrup straps.	Cruppers.	Driver's whips.	Martingales and collars.	Surcingles.	Saddles.
First Brigade staff																								
Seventh Regiment																								
Ninth Regiment																								2
Tenth Battalion													52	3	2	2								
Eleventh Regiment																								
Twelfth Regiment																								
Thirteenth Regiment		5	2					3	1	2														
Twenty-third Regiment																								
Thirty-second Regiment																								
Forty-seventh Regiment																								
Sixty-fifth Regiment																								
Seventy-fourth Regiment																								
Second Separate Company																								
Fourth Separate Company																								
Fifth Separate Company																								
Sixth Separate Company																								
Seventh Separate Company																								
Tenth Separate Company																								
Thirteenth Separate Company																								
Sixteenth Separate Company																								
Seventeenth Separate Company																								
Eighteenth Separate Company																								
Nineteenth Separate Company																								
Twentieth Separate Company																								
Twenty-third Separate Company																								
Twenty-fourth Separate Company (disbanded)																								
Twenty-sixth Separate Company																								
Thirty-third Separate Company																								
Thirty-sixth Separate Company																								

Forty-first Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Third Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Battery	7	4	4	12	4	8	8	4	2	....	2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixth Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Battery (disbanded)	12	5	....	3	4	5	5	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Late Fourth Division	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Late Sixth Brigade	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Late Eighth Brigade	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Albany Burgesses Corps	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	19	14	6	15	8	13	13	8	3	2	2	1	52	3	52	53	8	41	41	11	16	41	1	22	9	5	12	16	....	....

ABSTRACT D—*(Continued).*

	Spurs.	Spur straps.	Saddle cloths.	Saddle girths.	Halters.	Horse collars.	Saddle bags.	Hames.	Breechings.	Wheel traces.	Shells, 12 pdr.	Canister shot, 12 pdr.	Cartridge bags.	Friction primers.	Metallic ball cartridges, cal. 50.	Remington rifles, cal. 50.	Remington bayonets.	Whitney rifles, cal. 44.	Remington carbines.	Wingate indicators.	Reloading implements, sets.	Sabers.	Cross belts, dress.
First Brigade staff																							
Seventh Regiment																		10					
Ninth Regiment																125	125	10					
Tenth Battalion						2		4	2	4					3,680	9	1			10			229
Eleventh Regiment																1		4					
Twelfth Regiment																37	1				2		
Thirteenth Regiment																							
Twenty-third Regiment																		2					
Thirty-second Regiment																							
Forty-seventh Regiment																							
Sixty-fifth Regiment																							
Seventy-fourth Regiment																							
Second Separate Company																							
Fourth Separate Company																							114
Fifth Separate Company																							
Sixth Separate Company																							
Seventh Separate Company																							164
Tenth Separate Company																							
Thirteenth Separate Company																							
Sixteenth Separate Company																							
Seventeenth Separate Company																							
Eighteenth Separate Company																							
Nineteenth Separate Company																							
Twentieth Separate Company																							
Twenty-third Separate Company																							
Twenty-fourth Separate Company (disbanded)															3,500	65	65						
Twenty-sixth Separate Company																							
Thirty-third Separate Company																							
Thirty-sixth Separate Company																							

Forty-first Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	122
First Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Battery	14	....	79	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	....
Third Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Battery	8	8	14	9	29	....	....	....	....	....	18	18	247	112	....	....	....	....	....	....	....	....	....	....	53	....
Sixth Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Battery (disbanded)	....	....	4	....	....	....	....	....	....	....	....	....	....	....	12,100	2	....	....	....	....	....	....	....	....	....	....
Late Fourth Division	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Late Sixth Brigade	....	....	12	11	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Late Eighth Brigade	....	....	15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	17	....	....	....
Albany Burgesses Corps	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	22	8	124	25	29	2	1	4	2	4	18	18	247	112	19,280	242	192	16	17	10	2	60	629			

ABSTRACT D—*(Continued).*

	Cross belt pl'tes, dress.	Waist belts, dress.	Waist belt plates, dress.	Cartridge boxes, dress.	Bayonet scabbards, dress.	Waist belts, fatigue, (old model).	Waist belt plates, fatigue (old model).	Cartridge boxes, fatigue (old model).	Bayonet scabbards, fatigue (old model).	Pistol holsters.	Saber belts.	Saber belt plates.	Carbine slings.	Carbine swivels.	Saber knots.	Gun slings.	Knapsack.	Haversack.	Canteens.	Overcoats.	State service coats.	State service trowsers.
First Brigade staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ninth Regiment	....	....	....	....	....	395	356	400	431	....	....	....	....	....	....	152	....	....	....	3	46	40
Tenth Battalion	75	94	72	72	67	51	....	....	....	....	....	....	....	....	....	53	....	....	....	1	126	79
Eleventh Regiment	....	....	....	....	....	499	512	421	563	....	....	....	....	....	....	61	....	....	....	....	....	....
Twelfth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	38	16	48	149
Thirteenth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	43	....	....	25	100	89
Twenty-third Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	52	72
Thirty-second Regiment	....	....	....	....	....	413	446	437	438	....	....	....	....	....	....	....	....	....	....	....	....	....
Forty-seventh Regiment	....	....	....	....	....	430	430	376	399	....	....	....	....	....	....	195	....	....	....	....	....	....
Sixty-fifth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	138	....	....	....	....	....	....
Seventy-fourth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Separate Company	....	....	....	....	....	100	100	100	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Separate Company	....	....	....	....	....	62	62	62	62	....	....	....	....	....	....	....	....	....	....	....	....	....
Fifth Separate Company	44	56	56	....	....	124	127	129	125	....	....	....	....	....	....	....	....	....	....	5	....	....
Sixth Separate Company	....	....	....	....	....	100	100	100	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Separate Company	....	....	....	....	....	95	92	97	99	....	....	....	....	....	....	....	....	....	....	....	....	....
Tenth Separate Company	....	....	....	....	....	72	72	72	72	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirteenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixteenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Seventeenth Separate Company	....	....	....	....	....	54	54	54	54	....	....	....	....	....	....	....	....	....	....	15	....	....
Eighteenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Nineteenth Separate Company	120	70	110	55	55	110	110	100	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Twentieth Separate Company	....	....	....	....	....	107	107	107	114	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-third Separate Company	....	....	....	....	....	90	90	90	90	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-fourth Separate Company (disbanded)	....	....	....	1	....	73	69	62	70	....	....	....	....	....	....	63	66	66	66	58	57	43
Twenty-sixth Separate Company	....	....	....	....	....	100	100	100	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-third Separate Company	....	....	....	....	....	78	78	78	78	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-sixth Separate Company	....	....	....	....	....	54	55	60	60	....	....	....	....	....	....	....	....	....	....	....	....	....

	56	61	72	66	64	96	96	100	102	....	....	....	....	....	....	....	....	....	....
Forty-first Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Battery	....	....	....	....	....	....	....	....	....	22	22	....	....	....	....	....	17	1	8
Second Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Third Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Battery	....	....	....	....	....	....	....	....	....	76	76	....	....	47	....	....	117	69	65
Sixth Battery	....	....	....	....	....	68	....	68	68	....	....	....	....	....	....	....	....	....	....
Seventh Battery (disbanded)	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Late Fourth Division	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....
Late Sixth Brigade	....	....	....	....	....	15	15	....	....	....	....	18	12	....	....	....	11	19	18
Late Eighth Brigade	....	....	....	....	....	80	80	80	80	....	....	....	....	....	....	....	....	....	....
Albany Burgesses Corps	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	295	281	310	194	186	3,166	3,151	3,095	3,305	2	98	98	18	12	47	662	109	183	173	207	512	567

ABSTRACT D—*(Continued).*

	State service helmets.	State service forage caps.	Blouses.	Dress coats (old style).	Uniform trousers (old style).	Forage caps (old style).	Dress hats (old style).	Pompons.	Helmet plumes.	Helmet cords.	Epaulettes.	Leggins.	Blankets (woolen).	National colors (silk).	State colors (silk).	Brigade colors (silk).	Garrison flags.	Infantry guidons.	Artillery guidons.	Color socket and sling.	Guidon socket and strap.	Guidon staves.
First Brigade staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....
Seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
Ninth Regiment	....	46	369	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tenth Battalion	27	7	95	2	157	137	1	....	....	....	18	....	....	....	....	....	....	....	....	....	....	....
Eleventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twelfth Regiment	118	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirteenth Regiment	....	40	....	13	....	....	29	21	....	....	....	....	....	1	1	....	....	2	....	....	....	....
Twenty-third Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-second Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Forty-seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixty-fifth Regiment	....	....	42	3	166	10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventy-fourth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Separate Company	....	....	40	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fifth Separate Company	....	....	44	58	102	58	58	62	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirteenth Separate Company	....	....	70	62	62	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixteenth Separate Company	....	....	18	....	15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventeenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Eighteenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Nineteenth Separate Company	....	....	....	56	17	....	58	58	....	....	114	....	....	....	....	....	....	....	....	....	....	....
Twentieth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-third Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-fourth Separate Company (disbanded)	57	57	75	....	....	....	31	....	....	....	....	26	....	....	....	....	....	....	....	....	....	....
Twenty-sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-third Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Forty-first Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Battery	....	...	75	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
Third Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....
Fourth Battery	65	50	....	....	....	....	....	....	62	...	....	....	104	....	....	....	....	....	1	1	1	....
Sixth Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Battery (disbanded)	....	....	15	....	....	....	....	....	....	....	....	....	38	....	....	....	....	....	....	....	....	....
Late Fourth Division	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Late Sixth Brigade	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Late Eighth Brigade	19	17	....	....	....	....	....	....	18	18	....	....	....	....	....	....	....	....	....	....	....	....
Albany Burgesses Corps	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	286	219	843	194	519	205	177	141	80	18	132	26	142	1	1	1	1	2	3	1	2	1

ABSTRACT D—*(Continued).*

	Signal equipment canteens.	Signal equipment flame shades.	Signal flags.	Three jointed poles.	Canvas covers for signal equipments.	Worms for signal equipments.	Signal torches.	Signal extinguishers.	Haversacks for signal equipments.	Snare drums.	Snare drum sticks.	Snare drum slings.	Snare drum heads (snare).	Snare drum shells.	Bugles.	Shovels.	Felling axes.	Camp stools.	Sofas.	Lounges.	Rocking chairs.	Arm chairs.
First Brigade staff																						
Seventh Regiment																						
Ninth Regiment												11										
Tenth Battalion										10	12	7										
Eleventh Regiment											36	23										
Twelfth Regiment											20											
Thirteenth Regiment																						
Twenty-third Regiment										12												
Thirty-second Regiment											24	7										
Forty-seventh Regiment														8								
Sixty-fifth Regiment																						
Seventh Regiment													2									
Second Separate Company																						
Fourth Separate Company																						
Fifth Separate Company																						
Sixth Separate Company																						
Seventh Separate Company																						
Tenth Separate Company																						
Thirteenth Separate Company																						
Sixteenth Separate Company																						
Seventeenth Separate Company																						
Eighteenth Separate Company																						
Nineteenth Separate Company																						
Twentieth Separate Company																						
Twenty-third Separate Company																						
Twenty-fourth Separate Company										2	1	1					6		1		1	1
Twenty-sixth Separate Company (disbanded)																						
Thirty-third Separate Company																						
Thirty-sixth Separate Company																						

Forty-first Separate Company																														
First Battery																														
Second Battery																														
Third Battery																														
Fourth Battery																														
Sixth Battery																														
Seventh Battery (disbanded)																														
Late Fourth Division																														
Late Sixth Brigade																														
Late Eighth Brigade																														
Albany Burgesses Corps																														
Total	3	7	18	4	4	4	8	7	3	24	93	49	2	8	4	4	14	10	1	1	1	1								

ABSTRACT D — *(Concluded).*

	Sofa chairs.	Desk chairs.	Office chairs.	Center tables.	Chamber set (12 pieces).	Curtains.	Curtain poles.	Carpets.	Carpet crash.	Rugs.	Writing desks.	Book cases.	Umbrella stands.	Looking glasses.	Wash stands.	Letter presses.	Hand tongues.	Arm chests.	Packing cases.	Hand lanterns.	Iron target slabs.
First Brigade staff	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	13	....	....
Ninth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	8	....	....
Tenth Battalion	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	....	....
Eleventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twelfth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	3	....	....
Thirteenth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-third Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....
Thirty-second Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Forty-seventh Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sixty-fifth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Seventy-fourth Regiment	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Second Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Fourth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Fifth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Seventh Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Tenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....
Thirteenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Sixteenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5
Seventeenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....
Eighteenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Nineteenth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twentieth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Twenty-third Separate Company	4	....	....	2	....	....	....	1	....	....	....	....	....	....	....	....	....	3	2	4	7
Twenty-fourth Separate Company (disbanded)	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Twenty-sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	6
Thirty-third Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thirty-sixth Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Forty-first Separate Company	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
First Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Second Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....
Third Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fourth Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	15	6	....
Sixth Battery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Seventh Battery (disbanded)	....	....	....	....	...	....	....	....	....	....	....	....	....	....	....	....	....	1	3	....	....
Late Fourth Division	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Late Sixth Brigade	....	2	12	....	1	8	7	....	1	1	1	1	1	1	1	1	....	....	6	....	....
Late Eighth Brigade	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Albany Burgesses Corps	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	4	2	12	2	1	8	7	1	1	1	1	1	1	1	1	1	1	7	86	10	18

ABSTRACT E.

RECEIPTS AND DISBURSEMENTS OF CASH UNDER A COMMISSION CONSISTING OF MAJOR-GENERAL JOSIAH PORTER, ADJUTANT-GENERAL, BRIGADIER-GENERAL EMIL SCHAEFER, INSPECTOR-GENERAL, BRIGADIER-GENERAL J. M. VARIAN, CHIEF OF ORDNANCE, APPOINTED BY LAW FOR THE BUILDING OF ARMORIES AND IMPROVEMENTS TO STATE CAMP, FROM SEPTEMBER 30, 1886, TO SEPTEMBER 30, 1887.

Receipts.

Cash received from State Treasurer and disbursed on account of improvements at State Camp (chapter 484, Laws of 1886, chapter 460, Laws of 1887)	$29,952 83
Cash received from State Treasurer and disbursed on account of Newburgh Armory (chapter 330, Laws of 1886)	4,966 69
Cash received from State Treasurer and disbursed on account of Oneonta Armory (chapter 299, Laws of 1886),	5,472 25
Cash received from State Treasurer and disbursed on account of Walton Armory (chapter 429, Laws of 1885, chapter 482, Laws of 1886)	4,677 95
Cash received from State Treasurer and disbursed on account of Troy Armory (chapter 330, Laws of 1886),	5,619 25
Cash received from State Treasurer and disbursed on account of Elmira Armory (chapter 455, Laws of 1885, chapter 283, Laws of 1887)	14,949 93
Total	$65,638 90

(F.)

REPORT OF THE SURGEON-GENERAL FOR 1887.

The Adjutant-General, State of New York, Albany, New York:

SIR.—I have the honor to submit to your consideration my sixth consecutive annual report relating to the State Camp of Instruction at Peekskill N. Y., and the National Guard at large.

MEDICAL SUPPLIES.

On previous occasions the medical supplies for the use of the State camp have been selected by the Surgeon-General with or without suggestions from the medical officers of the commands for which they were intended. Heretofore a well-equipped drug store has been at the command of the medical officers of the National Guard while in camp. If perchance the fancy remedies of the latest times were asked for by the medical officers, they too, if not at hand, were procured for them at once. This course is well enough as a means of instruction as to the demands of the men while on duty, but as a practical measure it has become inconsistent with the inculcations of self-reliance in the medical officers at times when they must depend each on his own knowledge of the requirements of the occasion. I, therefore, suggest that in future encampment the commandants of military organizations be allowed a certain sum with which the medical officers of the organization can provide the medical and surgical supplies that in their judgment may be necessary for the occasion. The medical officers of the guard are now sufficiently familiar with their duties while in camp, and with the demands that may be made upon them at this time, to act intelligently in the selection of these supplies, if they are ever to be able to do so. If any prove themselves incompetent for duty, in time of peace, then, indeed, should it be known, that men competent to act in times of war may be selected. Since there are data in my possession already, which show definitely the amounts expended by the State for drugs for individual organizations during past encampments, it will be an easy matter to allot sufficient funds to succeeding organizations to enable their medical officers to provide all that will be consistent with both general and special requirements.

HOSPITAL STEWARDS.

The issuing of medical funds to the organizations in this manner, will require at once that the hospital stewards of organizations be qualified by law to dispense remedies. The order of the last encampment making this requirement, had a salutary effect, yet, even this order was sought to be practically annulled in occasional instances, by an ingenious though transparent sophistry unworthy of its advocates. The frequent inability to properly discriminate between duty on one hand and policy on the other is too often seen in the medical officers of the National Guard to constitute soldiers of the exponents of those principles, except in a social sense.

READY RELIEF TO THE INJURED.

In my last report your attention was called to the inportance of organizing a corps for the instruction of a certain number of the members of the National Guard in the ways and means of rendering prompt and efficient aid to the injured while in active service. I am happy to be able to state that this matter is rapidly approaching a point that bids fair to cause its adoption in the military organizations in the State. A most active and efficient committee is now engaged in putting the finishing touches on the report of the system to be employed in the course of instruction. And, in this connection, I desire to commend your attention to the names of Majors Duncan, Stimson and Henry, each of whom has labored with untiring zeal on this committee to organize and perfect a system which bids fair to become the first one of this kind that has been introduced into the National Guard of this country. The proper performance of the duties necessary to prepare men for this service will require an outlay of time, thought and money on the part of the medical officers of organizations, and also a small amount of money on the part of the State. The State authorities will not shrink from their duty in the matter, since to do so is to place a light estimate on the importance of instruction that can but benefit the members of the guard, and the general public in times of need. The success of this system will be largely dependent on the ability and correctness of those medical men under whose charge it will be placed. It is deemed advisable by those who can foresee the liability of the occurrence of inefficient instruction, on account of incompetency or indifference of medical officers, that hereafter all medical officers to be appointed in the National Guard be examined by a competent board of medical examiners, to determine their ability, before they be commissioned. I think this course to be an entirely proper one. Competent men can find no fault with it; incompetent men are not wanted

It will add to the dignity of the position of a medical officer, by causing each to feel that he has been found worthy by his superiors in experience and in rank. It is true that this course may interfere often with the rewards paid by commanding officers of military organizations in appointing indifferent men to responsible positions on the basis of good fellowship alone. However, all worthy commanding officers can but concur with the plan that will afford the best security to those under their charge.

KITCHEN, COOK-HOUSE, ETC.

In my last report the necessity of improving the surroundings of those structures was most emphatically stated. During the last encampment the odors associated with those buildings were inconsistent with the comfort of the soldiers who were obliged to eat their rations in the mess-hall, and dangerous to the health of the help that was of necessity constantly surrounded by them. The earth's surface beneath the kitchen and cook-house is foul from the decomposition of the fluids that have saturated it for years. But one course remains, to make these present structures safe for those laboring in them, which is to remove all the offensive earth, grade the surface and cover it with cement, so as to convey at once into the sewer all polluting discharges that fall into it.

BATHING.

The most popular improvement of the camp, during the last season, was the system of bathing that had been introduced. I respectfully recommend that the capacity of the bathing-house be increased at least one half, to allow a fuller and more comfortable compliance with the demands of the men and of nature.

SCHOOL SINKS.

The system of school sinks that is introduced is the best system for the purposes of a camp known to sanitary engineering. The defects of the methods of adjustment of the sinks, and of the pipes connected with them, which have since been discovered, account fully for the annoyance caused by them during the last season. A trivial expense will, without doubt, cause them to render the efficient service that had been so confidently anticipated of them. I am of the opinion that the wooden conduit forming the termination of the main sewer will require to be extended into the current that flows beneath the railroad bridge, and possibly much beyond this point, in order to convey to the requisite distance the polluting discharges necessarily associated with the demands of nature, in connection with large bodies of men. It was noticed by myself and by others on several occasions, and also it is the subject of report by many of the individual officers, that the

inequality of the grade of the camp and parade-ground in many places caused large surface collections of water to remain for a considerable time after severe showers of rain. The remedy for this condition is a self-evident one, and measures should be taken to obviate its recurrence before another encampment is ordered.

PRECAUTIONARY MEASURES BY MEDICAL OFFICERS.

I would fall short of doing my duty if I were to allow this opportunity to pass without calling your attention to the wisdom that is displayed by many of the medical officers in the manner in which they call the attention of the members of organizations to the proper means of preventing disease and avoiding discomforts while on duty.

It will be noticed throughout the several reports of these officers that they fully appreciate the importance of "precaution" in their attention to the wants of the men. The evidences of these precautions are multiplying from year to year as these officers improve by observation and experience, and as the commanding officers themselves profit by encouraging and heeding salutary advice of this kind. It is to be hoped that in the future, more than in the past, the officers newly elected to the command of organizations will, so far as possible, retain the able and efficient medical members of the staff. Their experience can but strengthen the commandants under circumstances that might otherwise be attended by distrust, and be followed by physical disorder to the members of the command.

I desire also to return my thanks for the kindness of Mr. W. E. Ford, of the firm of Hazard, Hazard & Co. of this city, for the repetition of the courtesy of loaning to the State a complete outfit of surgical instruments. By this consideration they have saved the State great expense, while at the same time its citizen soldiery have been protected from possible disorder more thoroughly than in the ordinary walks of citizenship. The Post hospital steward, Frank Warner, has, as usual, attended to his part of the duties of the medical department with the self-same courtesy and fidelity that has heretofore characterized his actions at all times. I am thankful to be able to acknowledge the unvarying courtesies and expressions of confidence that have at all times been shown to me by my associate officers, and by the officers of the entire National Guard. These manifestations of themselves alone are more than a recompense to me for the time and thought employed for the performance of the duties of the position with which I am honored.

Very respectfully yours.

JOSEPH D. BRYANT,

Brig. General and Surgeon-General, S. N. Y.

Medical Report of Seventh Regiment, N. G. S. N. Y., from June 18 to June 25, 1887.

DATE.	Number prescribed for daily.	*Number of prescriptions written daily.	Number of men in hospital.	Number ill in quarters.	Number excused from duty on account of illness.	Number in camp daily.	Per cent prescribed for daily.	Disorders for which Medicines were Dispensed.							
								Dermatitis.	Odontalgia.	Urethritis catarrhalis.	Bronchitis.	Lumbago.	Constipatio.	Loco motus humerus (sinest).	Stremma.
June 18	1	1	.....	....	.....	....	.....	1	...	...	...	....	...	...	...
June 19	9	8	.....	....	.....	....	.....	1	1	1	1	1	1	1	1
June 20	18	19	.....	3	3	....	.....	1	...	...	1	1	4	...	...
June 21	14	14	.....	1	1	....	.....	1	...	...	...	1	3	...	...
June 22	8	11	.....	...	....	....	.....	1	...	...	1	2	...	...	...
June 23	11	13	.....	....	.....	....	.....	1	...	...	...	...	...	...	...
June 24	7	9	.....	....	.....	....	.....	1	...	...	...	...	...	...	...
June 25	4	5	.....	....	.....	....	.....	1	...	...	...	...	...	...	...
Totals	72	80	.....	4	4	....	.....	8	1	1	3	7	8	1	1

Medical Report of Seventh Regiment — (Continued).

DATE.	DISORDERS FOR WHICH MEDICINES WERE DISPENSED.																	
	Rheumatismus musculorum.	Dermatitis calonee.	Furunculus.	Contusum.	Herpes.	Conjunctivitis.	Intertrigo.	Coryza.	Tonsilitis.	Diarrhœa.	Abrasus.	Malaria.	Retentio urinæ.	Hordeolum.	Rheumatismus acutus.	Gastralgia.	Vulnus incisum.	Total.
June 18	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
June 19	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9
June 20	....	5	1	2	1	1	1	....	....	....	....	....	....	....	....	....	....	18
June 21	1	1	....	....	....	1	1	1	1	1	1	1	....	....	....	....	....	14
June 22	....	....	....	....	....	1	1	1	....	....	....	1	....	....	....	....	....	8
June 23	....	....	1	....	....	....	....	2	1	1	....	1	1	1	....	....	....	11
June 24	....	....	....	....	....	....	....	3	2	....	....	....	....	....	1	....	....	7
June 25	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	1	4
Totals	2	6	2	2	1	3	3	7	5	2	1	3	1	1	1	1	1	72

Medical Report of Seventh Regiment — Meteorological Record — (Continued).

DATE.	TEMPERATURE RECORD.					Average daily record.	BAROMETRICAL RECORD.					Average daily record.	HYGROMETER — DRY.				Average daily record.
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.							Deg.	Deg.	Deg.	Deg.	Deg.
June 19	78	86	86	70	68	77.6	29.8	29.8	29.8	29.7	29.8	29.8	79	88	86	71	81
June 20	79	88	89	82	70	81.6	29.8	29.9	29	29	29	29.3	79	88	90	82	84.75
June 21	68	84	90	88	72	80.4	29	29	28	28	28	28.4	71	86	87	80	81
June 22	70	84	75	69	62	72	27.5	27	27.5	27.5	27.5	27.4	72	84	70	70	74
June 23	70	75	70	68	58	68.2	27.5	28	28.5	28.5	28.5	28.2	68	72	70	64	68.5
June 24	78	82	82	68	62	74.4	28	29	29	30	30	29.2	78	84	88	88	84.5
Average	....	....	....	....	....	72.2	....	....	....	....	....	27	....	....	....	....	78.9

Medical Report of Seventh Regiment — Meteorological Report — (Concluded).

DATE.	HYGROMETER — WET.				Average daily record.	DIRECTION OF WIND.					Remarks.
	9 A. M	12 M.	3 P. M.	6 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	
	Deg.	Deg.	Deg.	Deg.	Deg.						
June 19	72	78	76	70	74	S.	S.	S.	S. W.	S. W.	Rain; P. M.
June 20	74	80	80	75	77.25	S.	S.	S. W.	S.	S.	Clear.
June 21	68	89	79	71	76.75	S. E.	S.	S. W.	S. W.	S. W.	Clear.
June 22	74	78	69	68	72.25	S. E.	S.	W.	W.	W.	Rain; P. M.
June 23	68	74	68	64	68.5	.....	.....	.....	.....	.....	Rain.
June 24	74	87	78	62	75.5	S.	S.	S.	S.	S.	Clear.
Average	.....	.....	.....	.....	74	.....	.....	.....	.....	.....	

I certify that the above report and record is correct.

DANIEL M. STIMSON,
Surgeon, Seventh Regiment, N. G. S. N. Y.

NEW YORK CITY, N. Y., *July* 2, 1887.

[Indorsed.] New York city, July 2, 1887. Seventh Regiment, N. G. S. N. Y., by the Surgeon. Medical report of service. Camp of Instruction, near Peekskill, N. Y.

As the within report shows, nothing calling for close medical care occurred during the encampment of the Seventh regiment, N. G., S. N. Y. The only unusual case was a luxation of the shoulder joint sustained while diving into the Hudson river.

Much time was given to the inspection of the new sinks, bath-house, drains and sewers. The result of this inspection may be briefly given. The new school sinks are a great improvement over the old ones—first, because they are within the sentry lines; second, because they are built in the manner recognized by sanitarians as the best.

The experience of the season will show whether the troughs in the sinks are large enough. They ought to be emptied hourly during the day, and half-hourly for an hour and a half after breakfast and dinner. The holes in the seats are too far back to ensure cleanliness in the troughs, but unless the latter are wider the holes can not be placed further forward without the person coming in contact with the front of the troughs.

The servants' sink is too small to accommodate the 100 or more persons who use it. The sink at the point near the camp of the battery should be moved. Too much of the caretaker's time is taken in emptying it properly. The servants who use it should use the general servants' sink, or a new school sink, connected with the sewer, should be built.

In all the sinks, the water used in flushing them siphons out when the troughs are filled above a certain point, seemingly because the valves at the exits become clogged.

The bath-house is a success beyond anticipation. From 130 to 250 men bathed daily during the week. It was open from 6 A. M. to 6 P. M., except during breakfast and dinner, and during one and one-half hours after each of those meals. Enlisted men can bathe only on permits from one of the surgeons; officers and non-commissioned officers needed no permits. The benefits and comforts of the bath-house can hardly be over estimated.*

The sewers worked well. A stoppage on Friday was due to the fact that there was no grating at the sewer openings to prevent them from being used as waste boxes; another stoppage was due to the mud and sand which covered the cobble stones at the sewer openings being washed into the sewers by the heavy rains, and filling the traps. These cobblestones should be left uncovered by any sand or earth.

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* The temperature of the water was kept at from 70° to 72° Fahr.

As a whole, the new sanitary arrangement are a complete success. The only points to be criticised are minor and of detail, in no way relating to the general plan.

The policing of the camp was good; that of the battery quarters deserves especial mention.

[First indorsement.] Headquarters, Seventh Regiment, N. G. S. N. Y., Park Avenue and Sixty-sixth street, New York city. New York, July 5, 1887. Respectfully forwarded. [Approved] Emmons Clark, Colonel.

HEADQUARTERS TWELFTH INFANTRY,
FIRST BRIGADE, N. G. S. N. Y.,
NEW YORK, *July* 16, 1887.

GENERAL.—I have the honor to submit to your consideration the following report of the medical department of this regiment during its encampment at the State Camp of Instruction at Peekskill, from June twenty-fifth to July second inclusive.

The regiment assembled at the armory Saturday morning and presented a body of men 556 strong. With the assistance of the company commanders I endeavored during the month previous to our tour of duty to ascertain the physical status of the command; and in all cases men who, upon examination, were found wanting in physical vigor were relieved from duty upon my recommendation. On the steamer awaiting our arrival I found Captain Miller with the Seventh Separate Company, numbering thirty-four officers and men in excellent condition.

The trip to Peekskill was without any special medical incident. We arrived at Roa Hook about 3.30 P. M. With the exception of two men all were in good condition, and marched to the camp. These two men were willing and anxious to join the command, but as they had been slightly indisposed the previous night, I thought it more advisable they should ride in the ambulance.

Immediately upon my arrival I reported to the post surgeon, Major D. M. Stimson, for instructions, and accompanying him, made a thorough sanitary inspection of the entire camp ground and its environs, which were in excellent condition. I take this opportunity of thanking Major D. M. Stimson for the many valuable suggestions and information he bequeathed to me on this occasion, the result of his experience with his command, from which I reaped many benefits during my tour of duty.

Shortly after our arrival in camp the Thirty-fifth Separate Company, Captain Holland, reported for duty, sixty-seven officers and men.

I consider that the health of the regiment during the week was excellent. When one will consider the condition of the weather and the character of the daily routine of work, which was not deviated from in the slightest, he must decide this command to possess a class of men above the average in physical endurance.

Very few men were relieved from the performance of duty except on account of sickness; a reference to the record shows only a variation of ten between the maximum (658) and the minimum (648) daily present in the command.

While this course placed especial responsibility upon the medical department, and in a measure increased the number prescribed for daily, it certainly is a plan destined to increase discipline.

The great proportion of prescribing was done at sick call, doubtful cases being instructed to report to me again at 5 o'clock; there was no attempt at malingering, every man seemed to be filled with the spirit to do his full duty, and anxious to avoid the confession of weakness, if possible.

Many were placed upon the sick report for very slight ailments simply that they might be relieved from prolonged duty, which would expose them to the sun's rays; this course undoubtedly went far toward preventing serious case of heat prostration.

Every case of illness where the recumbent posture or rest in bed was required, or thought advisable, was transferred to the hospital; this I believe is the most judicious plan to pursue, as the surgeon can better in this way care for his patients and at the same time protect the interests of the regiment. During the entire week there were five men in the hospital, one case of chronic malaria, two of diarrhœa, one of sunburn with a tendency to facial erysipelas, and one of heat prostration which occurred after sunset upon the first of July, rendering the man unconscious for a short time and accompanied by slight heart failure.

The thirteen cases reported as heat exhaustion, included men who complained of slight premonitory symptoms, such as nausea and headache, and were therefore relieved from certain portions of the day's work; and one or two cases of syncope, which occurred at dress parade.

The four cases of heat prostration occurred on Friday, one during the skirmish drill at the moment of the final charge; this was the only man to leave the ranks during this test of physical

endurance and proficiency, made under the most unfavorable circumstances, with no wind and the temperature at ninety-seven degrees. Two others reported to me at the close of the exercises after return to camp. The fourth I have already referred to as occurring after sunset. The highest temperature in these cases was 101 degrees.

Finding myself alone with the command, my assistant, Dr. Charles L. Lindley, having been detained in the city by illness, I determined to resort to the members of the volunteer ambulance corps of the Twelfth Regiment for assistance. This application was readily granted by the commanding officer, and the service, faithfully performed by these men, I believe, convinced all of the utility and benefit to be derived from such an organization.

Having as yet only a limited number of men instructed in this work, I selected nine from the corps whom I considered best fitted and whose services would be least required for duty. From this number I made my daily detail, the number varying according to the amount of service anticipated; the maximum detail was five, the minimum three. One accompanied each battalion at drill; when the hospital was occupied one was constantly in charge.

These men carried with them such necessary simple remedies as might be required, and by prompt attention in a number of cases rendered relief and promoted the comfort of the men.

The stretcher was only carried upon the occasion of the last skirmish drill, when the command was marched about one mile from camp; it was then taken more as a precaution and followed the rear of the reserve; its services I am happy to say were not required, but its presence, if known to the men, had not the slightest demoralizing or depressing effect, as the result must prove.

About a month previous to our tour of duty, I recommended the adoption of a summer helmet; the best article I could find in the market was the regular army summer helmet; this weighs only half the black or the ordinary white helmet generally worn by the State troops, minus the trimmings. This helmet was adopted and was fully appreciated by the command, and certainly contributed to the general health.

The commanding officer very kindly consulted me on all questions appertaining to the sanitary condition of the regiment, and on the two or three occasions where I recommended a change of dress, he acted promptly upon my suggestion.

The commissary department receives my thanks for their kind services; I received no complaint during the week.

The policing of the grounds was perfect and during the last few days of our duty the streets were a model of cleanliness.

The sanitary arrangements, sinks, drain and water supply, cleaning and disinfecting systems seem very good, and are adequate to meet the demand of the number of men in camp; a few small defects in the sinks and drainage can be remedied at small expense. I fully indorse the suggestion to asphalt an area of ground beneath the mess hall, connecting this surface with a drain in order that the floors may be flushed regularly and the water carried immediately away from the vicinity of the grounds.

I wish on the part of the command to thank you for the great improvement in the bathing facilities; the shower baths I consider the greatest acquisition to the camp possible, and one which will surely conduce to make the course of instruction a success.

During my tour of duty, the bath-house was open, to all holding permits, according to the regulations adopted for the previous command, which seemed to fulfill all requirements. I would recommend that a ticket be prepared which will allow the holder the daily privilege of the bath-house; the date could readily be cancelled by the superintendent of the baths upon presentation.

Upon my arrival in camp, I discovered the hospital steward's quarters and hospital tents to be located outside of the line of sentinels; this was changed upon my recommendation.

The members of the ambulance corps, while upon duty in this department, carried the red cross on the left arm of the fatigue blouse; this insignia allowed the wearer to pass certain posts at night while in the discharge of duty.

I would recommend that a Ducker field hospital be purchased for better care of those requiring medical attention at the State Camp of Instruction.

The superiority of this over a tent will readily be seen, as it is perfectly weather and water-proof. The many advantages of having those seriously ill upon the sick list, under the immediate eye of the surgeon, must be recognized; again, having such a barrack, will allow the medical officers of the camp to utilize every opportunity to instruct the detailed members of the ambulance corps in regard to hospital service.

The quartermaster's supplies, blankets, cots, etc., were clean and in good condition; but some system should be inaugurated for the more thorough daily ventilation of blankets previous to morning inspection.

At about 11.30 A. M. July second, the Thirty-fifth Separate Company left the camp for its respective station, all well and in marching con-

dition. At 5.30 P. M. we were relieved by the Ninth Regiment; turned the camp over formally to that command, and marched to Roa Hook. Major Stephen W. Roof reported to me upon arrival; after a short conference with him upon the sanitary condition of the camp, I rejoined my command.

Five men who had been upon the sick list the previous day, were directed to ride in the ambulance to Roa Hook.

The return to our armory, was accomplished by steamboat, and was uneventful. Every man was ready to cover the short march from the landing at Fifty-fifth street to our armory.

The Seventeenth Separate Company resumed the trip by steamer to its destination; this command is to be complimented for performing its week of duty without a man on the sick report.

I take this opportunity of thanking Hospital Steward Benedict of the Twenty-second Regiment, who kindly performed duty in this department during our week in camp.

In closing my report, I wish to accord to all the State officers my most sincere thanks for the many courtesies extended to me.

Very respectfully submitted.

NELSON H. HENRY,
Major and Surgeon, Twelfth Infantry, N. G. S. N. Y.

To Brigadier-General JOS. D. BRYANT, *Surgeon-General, S. N. Y.*

Medical Report of Twelfth Infantry, N. G. S. N. Y., from June 25 to July 2, 1887.

DATE.	Number prescribed for daily.	Number of prescriptions written daily.	Number of men in hospital.	Number ill in quarters.	Number excused from duty on account of illness.	Number in camp daily.	Per cent prescribed for daily.	Disorders for which Medicines were Dispensed.							
								Chronic malaria.	Indigestion.	Diarrhœa.	Sprain.	Alcoholism.	Bubo.	Blistered feet.	Gonorrhœa.
June 25	1	4	.....	1	1	556	.17	1	....	....	....	...	....	....	.....
June 26	6	7	1	5	6	557	1.07	....	2	1	1	1	....	....	.....
June 27	9	8	2	7	9	553	1.66	....	....	4	....	....	1	1	1
June 28	19	15	2	17	17	555	3.42	....	2	1	1	....	....	1	.....
June 29	23	16	.....	23	23	554	4.15	....	1	1	....	....	....	1	.....
June 30	23	15	.....	23	23	554	4.15	....	....	3	...	....	....	1	.....
July 1	34	13	2	32	32	551	6.17	....	1	2	1	....	....	3	.....
July 2	3	3	1	2	3	553	.56	....	....	....	....	....	....	....	.....
Total	118	81	8	110	118	....	21.35	1	6	12	3	1	1	7	1
Average	.....	.....	.....	....	.....	554	2.66	....	....	....	....	....	....	....	.....

Medical Report of Twelfth Infantry—(Continued).

DATE.	Disorders for which Medicines were Dispensed.																			Total.
	Ingrown toe nail.	Pharyngitis.	Subac. rheumatism.	Myalgia.	Cephalalgia.	Chafing.	Heat exhaustion.	Incised wound.	Dyspepsia.	Chronic Bright's.	Sunburn.	Anuria.	Gleet.	Previous sunstroke.	Heat prostration.	Urticaria.				
June 25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....				1
June 26	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....				5
June 27	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....				7
June 28	1	1	1	3	1	3	....	1	....	....	....	....	....	....	....	....				12
June 29	1	....	....	....	2	....	3	2	1	1	1	1	....	....	....	....				14
June 30	....	....	....	....	1	....	....	1	....	....	....	....	1	....	....	....				12
July 1	....	....	1	....	1	....	6	....	....	1	....	....	1	1	4	....				23
July 2	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1				1
Total	2	1	2	4	4	3	12	3	2	1	1	1	1	1	4	1				75
Average	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....				....

Medical Report of Twelfth Infantry — Meteorological Record — (Continued).

DATE.	TEMPERATURE RECORD.						BAROMETRICAL RECORD.						HYGROMETER — DRY.				
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	Average daily record.	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	Average daily record.	9 A. M.	12 M.	3 P. M.	6 P. M.	Average daily record.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.							Deg.	Deg.	Deg.	Deg.	Deg.
June 25	72	78	84	82	68	75	32	32	32	32	32	32	72	76	82	86	79
June 26	82	80	76	68	63	72	32	32	32	32	32	32	80	80	76	67	74
June 27	71	76	78	73	58	68	33	33	33	32	33	33	72	78	76	74	75
June 28	80	85	92	86	63	77	33	33	33	33	32	33	80	86	92	78	84
June 29	82	87	94	85	68	78	32	32	32	32	33	32	82	89	95	86	88
June 30	84	91	99	90	74	84	32	32	32	31	31	32	84	92	100	84	90
July 1	87	97	98	92	77	87	32	31	31	31	31	31	87	96	94	90	92
July 2	89	95	...	....	....	....	31	31	....	....	....	....	88	96	....	....	.....
Average	81	86	89	82	67	77	32	32	31	31	31	31.5	80.6	86.6	87.8	80.7	83.1

Medical Report of Twelfth Infantry — Meteorological Record — (Concluded).

DATE.	HYGROMETER — WET.				Average daily record.	DIRECTION OF WIND.					Remarks.
	9 A. M.	12 M.	3 P. M.	6 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	
	Deg.	Deg.	Deg.	Deg.	Deg.						
June 25	64	66	70	74	68	E.	E.	Calm.	Calm.	Calm.	Clear.
June 26	76	68	67	64	68	Calm.	W.	N.	N.	Calm.	Cloudy; very slight shower; clear.
June 27	65	68	67	66	66	N.	N.	N.	N.	N.	Clear.
June 28	77	86	93	79	83	Calm.	S. W.	S. W.	S. W.	Calm.	Clear.
June 29	76	87	80	86	82	Calm.	Calm.	Calm.	Calm.	Calm.	Clear.
June 30	78	80	85	82	81	Calm.	Calm.	Calm.	Calm.	Calm.	Clear.
July 1	87	96	83	80	86	S. W.	Calm.	Calm.	S. W.	Calm.	Clear.
July 2	81	86	.....	.....	.....	S. W.	S. W.	.....	.....	.....	
Average	75.5	79.6	77.8	75.8	76.2	.....	.....	.....	.....	.....	

I certify that the above report and record are correct.

NELSON H. HENRY,

Major and Surgeon, Twelfth Regiment, N. G. S. N. Y.

NEW YORK CITY, N. Y., *July* 16, 1887.

Medical Report of Thirty-fifth Separate Company, N. G. S. N. Y., from June 25 to July 2, 1887.

DATE.	Number prescribed for daily.	Number of prescriptions written daily.	Number of men in hospital.	Number ill in quarters.	Number excused from duty on account of illness.	Number in camp daily.	Per cent prescribed for daily.	Disorders for which Medicines were Dispensed.				
								Indigestion.	Diarrhœa.	Chafing.	Heat exhaustion.	Total.
June 25	....	....	....	....	.....	67	....	....	....	....	....	.....
June 26	....	....	....	....	.....	67	....	....	....	....	....	.....
June 27	1	....	.....	1	1	67	1.49	1	....	....	....	1
June 28	1	....	....	1	1	67	1.49	....	1	....	....	1
June 29	4	2	1	3	4	64	6.25	....	1	1	1	3
June 30	1	....	....	1	1	62	1.61	....	....	....	....	.....
July 1	1	1	....	1	1	64	1.56	....	1	....	....	1
July 2	....	....	....	....	.....	64	....	....	....	....	....	.....
Total	8	3	1	7	8	65	12.40	1	3	1	1	6
Average	1	....	....	....	1	65	1.55	....	....	....	....	.....

METEOROLOGICAL RECORD.

For record see report of Twelfth Infantry, N. G. S. N. Y.

I certify that the above report and record are correct.

NELSON H. HENRY,

Major and Surgeon Twelfth Infantry, N. G. S. N. Y.

NEW YORK CITY, *July* 16, 1887.

Medical Report of Seventeenth Separate Company N. G. N. Y. S., from June 25 to July 2, 1887.

Date.	Disorders for Which Medicines were Dispensed.* No. in camp daily.
June 25	34
26	34
27	34
28	32
29	33
30	33
July 1	33
2	33
Average	33

*Clear record.

METEOROLOGICAL RECORD.

For report see record attached to report of Twelfth Infantry, N. G. S. N. Y.

I certify that the above report and record are correct.

NELSON H. HENRY,
Major and Surgeon Twelfth Infantry, N. G. S. N. Y.

NEW YORK CITY, *July* 16, 1887.

Medical Report of Ninth Regiment, N. G. S. N. Y., from July 2 to July 9, 1887.

DATE.	Number prescribed for daily.	Number of prescriptions written daily.	Number of men in hospital.	Number ill in quarters.	Number excused from duty on account of illness.	Number in camp daily.	Per cent prescribed for daily.	Disorders for which Medicines were Dispensed.																		
								Hydrocele.	Rheumatism.	Constipation.	Diarrhœa.	Paralysis.	Sprain.	Chafing.	Prostration.	Cerebral congestion.	Sunburn.	Ulcer.	Tonsilitis.	Conjunctivitis.	Subacute gastritis.	Total.
July 2	1	1	0	0	0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
July 3	20	16	1	0	1	....	....	1	....	12	1	....	1	2	1	1	1	....	....	....	....	1	18
July 4	22	15	0	0	2	....	....	....	....	6	4	....	1	1	1	....	....	1	....	....	....	....	15
July 5	14	6	1	0	1	....	....	....	....	3	5	1	1	1	1	....	....	....	....	....	....	....	13
July 6	15	10	1	0	1	....	....	....	1	2	5	....	....	2	1	1	1	....	1	....	....	....	14
July 7	23	16	0	1	0	....	....	....	....	7	6	....	1	2	1	2	1	....	....	1	....	....	18
July 8	22	14	0	1	0	....	....	....	....	5	5	....	....	2	2	....	1	....	....	....	....	1	18
July 9	2	2	0	1	0	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	2
Total	119	80	5	2	5	....	....	1	2	36	26	1	4	10	8	4	3	1	1	1	1	1	99

Medical Report of Ninth Regiment — Meteorological Record — (Continued).

DATE.	TEMPERATURE RECORD.					Average daily record.	BAROMETRICAL RECORD.					Average daily record.	HYGROMETER — DRY.				Average daily record.
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 P. M.	3 P. M.	6 P. M.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.							Deg.	Deg.	Deg.	Deg.	Deg.
July 2	90	90	91	88	75	87	30.1	30.1	30.1	30.1	30.1	30.1	90	92	98	87	91
July 3	83	90	88	80	70	80	30.1	30.1	30.2	30.1	30.1	30.1	90	93	82	88	88
July 4	80	78	75	72	70	73	30.1	30.1	30.1	30.	29.9	30.1	84	76	74	70	76
July 5	76	84	82	70	70	76	29.9	30.	29.9	29.	29.	29.	70	80	84	72	76
July 6	85	90	96	104	95	94	29.9	29.	29.9	28.9	28.9	29.9	85	90	93	100	92
July 7	80	90	98	87	72	85	29.9	29.	28.9	29.	29.8	28.9	86	90	98	86	90
July 8	86	90	94	87	76	85	29.8	29.9	29.9	29.9	29.9	29.9	86	90	96	80	88
July 9																	

Medical Report of Ninth Regiment — Meteorological Record — (Concluded).

DATE.	HYGROMETER — WET.				Average daily record.	DIRECTION OF WIND.				
	9 A. M.	12 M.	3 P. M.	6 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.
	Deg.	Deg.	Deg.	Deg.	Deg.					
July 2	86	92	98	87	90	S. E.	S. E.	S. E.	E.	S. E.
July 3	83	82	88	78	82	S. E.	S. E.	S. E.	S. E.	S. E.
July 4	82	80	78	74	78	S. E.	S. E.	S. E.	S. E.	Calm.
July 5	75	80	80	70	76	S. E.	S. E.	S. E.	Calm.	Calm.
July 6	80	82	82	86	85	Calm.	Calm.	S. E.	S. E.	S. E.
July 7	78	78	84	78	77	Calm.	S. E.	S. E.	S. E.	S. E.
July 8	80	78	82	72	79	Calm.	S. E.	S. E.	S. E.	S. E.
July 9										

I certify that the above report and record are correct.

S. W. ROOF,

Surgeon, Ninth Regiment, N. G. S. N. Y.

PEEKSKILL, N. Y., *July* 9, 1887.

Medical Report of Forty-seventh Regiment, N. G. S. N. Y., from July 10 to July 16, 1887.

DATE.	Number prescribed for daily.	Number of prescriptions written daily.	Number of men in hospital.	Number ill in quarters.	Number excused from duty on account of illness.	Number in camp daily.	Per cent prescribed for daily.	Disorders for which Medicines were Dispensed.						
								Malaria.	Painters' colic.	Constipation.	Diarrhœa.	Excoriations.	Bruises.	Total.
July 10	....	....	....	....	.....	329	....	....	....	....	....	....	....	
July 11	....	....	....	....	.....	332	....	....	....	....	....	....	....	
July 12	2	2	....	....	.....	334	0.59	....	....	....	1	....	1	2
July 13	5	5	....	....	.....	335	1.49	....	1	1	1	1	1	5
July 14	4	4	....	....	.....	335	1.19	....	....	....	4	....	....	4
July 15	....	....	....	....	.....	331	....	....	....	....	....	....	....	
July 16	1	1	....	....	.....	330	0.3	1	....	....	....	....	....	1
Total	12	12	....	....	.....	2,326	0	1	1	1	6	1	2	12

Medical Report of Forty-seventh Regiment — Meteorological Record — (Continued).

DATE.	TEMPERATURE RECORD.					Average daily record.	BAROMETRICAL RECORD.					Average daily record.	HYGROMETER — DRY.					Average daily record.
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.							Deg.	Deg.	Deg.	Deg.	Deg.	Deg.
July 10.....	81	88	83	70	68	78	29.58	29.60	29.60	29.60	29.60	29.596	83	90	84	73	68	79.6
July 11.....	79	81	84	76	70	78 .	29.10	29.10	29.10	29.12	29.12	29.108	79	82	86	80	78	81
July 12.....	80	85	91	82	68	81.2	30	30	29.08	29.05	29.06	29.44	80	86	93	82	74	83
July 13.....	90	97	98	96	82	92.6	29.06	29.06	29.05	29.05	29.05	29.052	90	98	99	94	83	92.8
July 14.....	80	84	86	68	64	76.4	30	30	30	30	30	30	82	87	88	78	69	80.8
July 15.....	80	80	78	68	64	74	29.06	29.06	29.08	29.08	29.10	29.076	80	80	68	68	62	71.6
July 16.....	78	90	96	.....	.....	88	29.92	29.97	29.87	.....	.....	29.887	77	90	97	.....	.....	88
Average	84	86 3-7	88	76 4-6	69 2-6	81.17	29.53	29.52	29.39	29.31	29.32	29.45	81 4-7	87 4-7	87 6-7	79 1-6	72 2-6	82.4

Medical Report of Forty-seventh Regiment—Meteorological Record—(Concluded).

DATE.	HYGROMETER—WET.					Average daily record.	DIRECTION OF WIND.				
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.					
July 10	79	82	84	73	68	77.2	N. E.	N. E.	N.	N.	N.
July 11	72	72	74	72	72	72.4	N. W.	N. W.	N. W.	N. W.	N. W.
July 12	72	74	84	82	68	76	N. W.	N. W.	N. W.	N. W.	N. W.
July 13	79	84	85	84	72	80.8	W.	W.	W.	W.	W.
July 14	74	74	75	68	64	71	N. E.	N. E.	N. E.	N. E.	N. E.
July 15	70	76	64	64	61	67	C.	C.	C.	C.	C.
July 16	73	82	82	.....	.....	81	C.	C.	C.	C.	C.
Average	74 1-7	77 5-7	79 1-7	73 5-6	67 3-6	75.05	.....	.....	.....	.....	.....

I certify that the above report and record are correct.

EDWARD H. ASHWIN, M. D.,
Major and Surgeon, Forty-seventh Regiment, Infantry.

BROOKLYN, N. Y., *July* 21, 1887.

Medical Report of Second Provisional Battalion, N. G. S. N. Y. from July 9 to July 16, 1887. — Meteorological Record.*

DATE.	TEMPERATURE RECORD.					Average daily record.	BAROMETRICAL RECORD.					Average daily record.	HYGROMETER — DRY.					Average daily record.
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.							Deg.	Deg.	Deg.	Deg.	Deg.	Deg.
July 10	81	88	83	74	68	78.80	29.58	29.60	29.60	29.60	29.60	29.56	83	90	84	72	....	82.25
July 11	79	81	84	76	70	78	29.01	29.01	29.01	29.12	29.12	29.05	79	82	86	80	70	77.40
July 12	80	85	91	82	68	81.20	30	30	29.08	29.06	29.06	29.45	80	86	93	82	74	83
July 13	90	97	98	96	82	92.60	29.06	29.06	29.05	29.05	29.05	29.05	90	98	99	94	83	92.40
July 14	80	84	86	76	68	78.80	30	30	30	30	30	30	82	87	88	78	69	80.80
July 15	80	80	78	68	64	74	29.06	29.06	30	30	30	29.62	80	80	68	68	62	71.60

*None.

Medical Report of Second Provisional Battalion — Meteorological Record — (Concluded).

DATE.	HYGROMETER — WET.					Average daily record.	DIRECTION OF WIND.					Remarks.
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.						
July 10	79	82	82	78	.....	79	N. E.	.....	.....	.....	.....	
July 11	73	72	74	72	72	72.60	C.	.....	.....	.....	.....	
July 12	72	74	84	80	68	75.60	W.	W.	W.	C.	.....	
July 13	79	84	85	84	72	78.80	W.	W.	W.	W.	W.	Weather clear.
July 14	74	74	75	68	64	71	C.	C.	C.	C.	C.	
July 15	70	76	74	64	61	79	N. W.	N. W.	C.	C.	C.	

I certify that the above report and record are correct.

JOHN P. WILSON,

First Lieutenant and Assistant Surgeon Nineteenth Separate Company,
Acting Surgeon Second Provisional Battalion.

PEEKSKILL, N. Y., *July* 16, 1887.

HEADQUARTERS FORTY-SEVENTH REGIMENT, INFANTRY,
N. G. S. N. Y.
BROOKLYN, *July* 21, 1887.

GENERAL.—I have the honor to report the tour of duty of the Forty-Seventh Regiment at the State Camp of Instruction near Peekskill, N. Y., from July ninth to July sixteenth inclusive.

The command left Brooklyn on the ninth of July at 11 A. M. on the steamer "Long Branch," arriving at Roa Hook about 3 P. M. and marching to the camp relieved the Ninth Regiment N. G. S. N. Y. The health of the men was perfect during the week, very few calls were made on the surgeons and several of those could have been avoided.

On the sixteenth of July about 3 P. M, the command was relieved by the Twenty-third Regiment N. G. S. N. Y., and started for Brooklyn marching to Roa Hook and thence by the steamer "Long Branch" arriving in Brooklyn at 8 P. M. without a single accident or case of sickness.

In the course of my duty as surgeon of the post, I made two regular inspections daily of the camp, one at 10 A. M. and again at 5 P. M., and it affords me great pleasure to be able to bear testimony to the painstaking and conscientious manner in which the various employés performed their functions.

I am satisfied that to the excellent and satisfactory shower-baths was due, much of the exemption from sickness enjoyed by the command; in this connection I am informed that not far from two hundred men daily availed themselves of the advantages of the baths.

The food was of good quality, in great abundance, and well prepared.

I recommended that tea be substituted for coffee at supper, which was complied with.

The water was good and plentiful and the drainage so far as I could discover was eminently satisfactory.

An improvement could be made by covering the ground under the mess hall with asphalt or some such material, the surface then being hard and not porous could be washed when necessary by the use of a hose and the water drained off.

Appended you will find the reports of the Forty-seventh Regiment which I trust will prove satisfactory. I also inclose the report of the medical officer of the Second Provisional Battalion.

Very respectfully.

EDWARD H. ASHWIN, M. D.,
Major and Surgeon Forty-seventh Regiment, Infantry.

To Brigadier-General JOSEPH D. BRYANT, *Surgeon-General, S. N. Y.*

Medical Report of Twenty-third Regiment, N. G. S. N. Y., from July 16 to July 23, 1887.

DATE,	Number prescribed for daily.	Number of prescriptions written daily.	Number of men in hospital.	Number excused from duty on account of illness.	Number in camp daily.	Per cent prescribed for daily.	DISORDERS FOR WHICH MEDICINES WERE DISPENSED.								
							Hemorrhoids.	Hemicrania.	Sprains.	Inflammation of hand.	Abscess.	Conjunctivitis.	Abrasion.	Constipation.	Rheumatism.
July 16	2	4	2	2	410	½	1	1	....	....	....	....	....	....	....
July 17	11	15	.....	.....	411	2 7-10	....	1	1	1	....	1	2	1	1
July 18	16	19	.....	.....	406	3 9-10	....	2	3	....	....	....	....	1	.....
July 19	10	17	1	1	393	2½	....	....	....	....	1	....	....	2	.....
July 20	11	16	1	1	383	2 4-5	....	....	....	....	....	1	....	1	.....
July 21	14	16	.....	.....	375	3 7-10	....	....	....	....	....	....	1	....	1
July 22	9	10	.....	.....	375	2 2-5	....	1	....	....	....	1	....	....	.....
July 23	3	3	.....	.....	405	.74	....	....	....	....	....	....	....	1	.....
Totals	76	100	4	4	3,158	.....	1	5	4	1	1	3	3	6	2
Average	9½	12½	.....	.....	394 7-10	.....	....	....	....	....	....	....	....	....	.....

Medical Report of Twenty-third Regiment — (Continued).

DATE.	DISORDERS FOR WHICH MEDICINES WERE DISPENSED.																	
	Renal congestion.	Diarrhœa.	Chill.	Malaria.	Indigestion.	Tonsilitis.	Bronchitis.	Coryza.	Hoarseness.	Cramps.	Torpid liver.	Exhaustion (heat).	Epilepsy.	Sun burn.	Myalgia.	Odontalgia.	Chafing.	Total.
July 16	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
July 17	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	11
July 18	....	6	1	....	....	....	....	....	....	....	....	....	....	1	2	....	...	16
July 19	....	2	....	....	1	2	....	1	...	....	...	....	....	1	....	....	....	10
July 20	....	5	....	....	1	....	....	....	....	...	1	...	....	....	1	1	....	11
July 21	....	2	....	1	3	2	1	2	1	....	...	....	....	....	....	....	....	14
July 22	....	1	....	....	1	....	....	....	....	3	1	1	....	....	....	....	....	9
July 23	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	3
Totals	2	16	1	1	6	5	1	3	1	3	2	1	1	2	3	1	1	76
Average	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....

Medical Report of Twenty-third Regiment — Meteorological Record — (Continued).

DATE.	TEMPERATURE RECORD.					Average daily record.	BAROMETRICAL RECORD.					Average daily record.	HYGROMETER — DRY.					Average daily record.
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.							Deg.	Deg.	Deg.	Deg.	Deg.	Deg.
July 17.....	94	88	90	86	74	86 2-5	29.90	29.80	29.70	29.80	29.85	29.81	95	88	92	88	79	88 2-5
July 18.....	82	92	78	78	73	80 3-5	29.76	29.80	29.80	29.85	29.90	29.82	83	90	87	80	77	83 2-5
July 19.....	80	82	86	89	66	80 3-5	30.	30.15	30.	30.40	30.	30.11	79	84	86	88	67	80 4-5
July 20.....	77	86	88	84	68	80 3-5	30.15	30.15	30.10	30.10	30.10	30.12	79	86	87	81	68	81 2-5
July 21.....	70	72	74	70	70	71 1-5	30.2	30.2	30.5	29.95	30.	30.17	70	72	74	71	70	71 2-5
July 22.....	80	88	84	82	76	82	29.80	29.80	29.80	30.	30.	29.88	79	81	86	82	78	81 4-5
July 23.....	86	82	74	....	.....	80 2-3	29.70	29.70	29.80	.....	.....	29.73	77	80	74	.....	.....	77
Totals	81 2-7	84 2-7	82	81½	71 1-6	.....	29.97	29.94	29.95	30.	29.97	.....	80 2-7	83	83 5-7	82 2-3	73 1-6	.....
Average ..	.....	.....	....	....	.....	80.29	.....	.....	.....	.....	.....	29.94	.....	....	.....	.....	.....	80 6-10

Medical Report of Twenty-third Regiment — Meteorological Record — (Concluded).

DATE.	HYGROMETER—WET.					Average daily record.	DIRECTION OF WIND.					Remarks.
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.						
July 17	85	80	84	86	78	82 3-5	N. E.	N. W.	N. W.	N. W.	N. E.	Partly cloudy and slight rain.
July 18	82	91	80	80	75	81 3-5	N. E.	N. E.	N. E.	N. W.	N. W.	Slight rain A. M., clear P. M.
July 19	80	84	88	90	66	81 3-5	N. W.	N. W.	N. E.	N. W.	N. W.	Cloudy A. M., clear P. M.
July 20	80	86	88	82	68	80 4-5	N. E.	S. W.	S. W.	S. E.	S. E.	Partly cloudy A. M., clear P. M.
July 21	69	72	74	71	70	71 1-5	N. W.	N. W.	N. W.	N. E.	N. W.	Rain—cloudy all day.
July 22	78	86	86	82	78	82	S. W.	S. W.	S. E.	E.	E.	Rain A. M., cloudy all day.
July 33	77	78	74	.....	.....	76 1-3	S. W.	S.	S.	.....	.....	Very heavy rain.
Totals	78 3-7	82 3-7	82	81 5-6	72 1-2	.....	.....	.....	.....	.....	.....	
Average	.....	.....	....	.....	.....	79 44-100	.....	.....	.....	.....	.....	

I certify that the above report and record are correct.

WM. E. SPENCER,

BROOKLYN, N. Y., *August* 1, 1887. *Captain and Acting Surgeon Twenty-third Regiment N. G. S. N. Y.*

[Indorsement.] Brooklyn, N. Y., August 1, 1887. By Acting Surgeon. Medical report of service, Twenty-third Regiment, N. G. S. N. Y.

[First indorsement.] Headquarters Twenty-third Regiment N. G. S. N. Y. Brooklyn, August 5, 1887. Respectfully forwarded. Charles E. Waters, Major, in the absence of the commanding officer.

HEADQUARTERS TWENTY-THIRD REGIMENT,
N. G. S. N. Y.,
BROOKLYN, *August* 2, 1887.

Brigadier-General JOSEPH D. BRYANT, *Surgeon-General S. N. Y.*

SIR.—I have the honor to submit the following report of the Twenty-third Regiment during its tour of duty from July sixteenth to twenty-third inclusive, and also inclose consolidated report. During the week we had a total of four men in hospital, two reporting sick Sunday A. M., both suffering from old troubles; they were sent home Monday. The other two were sick from digestive troubles brought about by dietary indiscretions, and were returned to duty at the expiration of twenty-four hours. There was also a case of epilepsy, which was discovered by the patient having a fit, the case was promptly sent home. The above cases were the only ones relieved from duty. We had also one case of exhaustion occurring at the close of a severe battalion drill, which was attended to by the ambulance corps. The medical attendance required during the week was for minor ailments, for the most part brought about by change of habits incumbent on camp life, or for chronic troubles aggravated by exposure. The weather, as a glance at the meteorological record will show, was not particularly favorable, and the regiment was on two or three occasions thoroughly wet, but as the men promptly changed and dried their clothing no serious results followed. The surgeons found the men very willing to be guided by their advice in the matter of taking care of themselves.

The regiment left the camp for home during a very severe rain storm, caught another in Brooklyn and arrived at the armory in a very damp condition, but so far as can be learned no one is suffering from their week at the State Camp of Instruction. The sanitary condition of the camp was perfect, the mess hall and kitchen, ice-houses, etc., were remarkable for their cleanliness and freedom from all odors — the main camp well policed and always clean — the new sinks gave every satisfaction and were at all times perfectly sanitary. The drainage of the camps during heavy rains is in my opinion inadequate; the staff-band and servants tents were wet a large portion of the time while the main camp dried rather slowly, the last may be due to the peculiarity of the soil, which absorbs moisture more freely some times than at others. The shower-baths were at once recognized as a luxury as well as a necessity and were probably more appreciated and enjoyed by the regiment than any other adjunct of the camp; they were freely used. There is one suggestion that I wanted to

make and that is that the number of showers be at least doubled for many did not use them on account of having to wait so long for their turn. The food was plentiful, of good quality and well cooked; the water supply first class, both in quantity and quality. There was but three ounces of alcohol prescribed by the surgeons during the entire tour. I do not feel justified in having the ambulance corps detailed as a whole (on account of the small percentage of the regiment present in camp) for drill and instruction, so adopted the following method; a detail of three or four members of the corps was made daily from the several companies. Each detail reporting to the surgeons at 5.30 A. M., when they were instructed as to their positions, duties, etc. To my mind the method of having an ambulance detail parade out in full sight of a regiment, supplied with stretchers, ice, medicine case, flag, etc., has rather a demoralizing influence on those taking part in the drill. Our details took tkeir place, usually at the ends of one of the company streets after the regimental line had been formed, supplied with all necessary articles, except the flag, and the first sergeants were told where they were to be found at adjutant's call, so that if any necessity arose for their use they could be called upon at once without any delay or confusion. We fortunately had but one call for service, and then the rapidity with which the detail arrived, the method in which they rendered aid, and the avoidance of all confusion, was favorably commented on. The regiment having afterward the utmost confidence in the corps; the corps was designated by a red cross pinned to the left sleeve of the blouse. All bathing parties were accompanied by a member of the corps, not in his charge but simply one of the party, but fortunately no serious occasion for their services arose. All members of the corps were willing to act as nurses, and three or four of them did for those in the hospital irrespective of company. The medical supplies allowed by the State and the sway allowed regimental surgeons are liberal and appreciated. The manner in which Acting Assistant Surgeon Cochran and our detailed Hospital Steward Welch attended to their several duties left nothing to be desired, and in conclusion permit me to congratulate you on the great service done the State by your able management of the medical department.

I am respectfully, your obedient servant.

WILLIAM E. SPENCER,

Captain and Acting-Surgeon Twenty-Third Regiment N. Y. S. N. Y

Medical Report of Seventy-first Regiment and Tenth Battalion, N. G. S. N. Y., from July 23 to July 30, 1887.

DATE.	Number prescribed for daily.	Number of prescriptions written daily	Number of men in hospital.	Number ill in quarters.	Number excused from duty on account of illness.	Number in camp daily.	Per cent prescribed for daily.	DISORDERS FOR WHICH MEDICINES WERE DISPENSED.						
								Cellulitis and rheumatism.	Indigestion.	Diarrhœa.	Conjunctivitis, catarrhal.	Sprain of back.	Rheumatism.	Total.
July 23	....	....	....	....	.....	634	....	....	....	....	....	....	....	....
July 24	....	....	....	....	.....	635	....	....	....	....	....	....	....	....
July 25	4	2	....	4	4	633	1.45	1	1	1	....	....	1	4
July 26	4	3	1	3	4	626	1.78	....	1	....	1	....	....	2
July 27	5	1	1	4	5	628	2.03	....	....	....	....	....	....	....
July 28	4	1	1	3	4	632	1.45	....	....	....	....	....	....	....
July 29	3	2	1	2	3	633	1.23	....	....	1	....	....	....	1
July 30	2	....	....	2	2	633	.76	....	....	....	....	1	....	1
Total	22	*9	4	18	22	....	8.70	1	2	2	1	1	1	8
Average	....	....	....	....	.....	631 6-8	1.09	....	....	....	....	....	....	....

* Renewals of prescriptions included. Prescriptions for remedies in bulk, not included.

Medical Report of Seventy-first Regiment and Tenth Battalion — Meteorological Record — (Continued).

DATE.	TEMPERATURE RECORD.					Average daily record.	BAROMETRICAL RECORD.					Average daily record.	HYGROMETER — DRY.					Average daily record.
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	
1887.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.							Deg.	Deg.	Deg.	Deg.	Deg.	Deg.
July 23	....	....	76	74	73	73½	.....	.....	29.07	29.09	29	29.045	74	74	74	74	74	74
July 24	82	81	83	78	76	80	30.04	30.07	30.07	30.05	30.04	30.05	81	81	82	79	77	80
July 25	88	88	89	89	74	85 3-5	30.09	30.09	30.05	30	30	30.04 3-5	86	88	87	87	74	84 2-5
July 26	82	87	84	82	79	82 4-5	30	29.90	30	29.96	29.98	29.96 4-5	84	89	84	82	80	83 4-5
July 27	82	88	96	89	78	86 3-5	29.94	29.50	29.30	29.50	29.60	29.56 4-5	82	90	96	94	92	90 4-5
July 28	83	92	91	81	76	84 3-5	29.95	29.94	29.90	29.85	29.70	29.86 4-5	83	90	92	90	78	86 3-5
July 29	86	94	83	81	70	82 4-5	29.92	29.95	29.94	29.93	30	29.54 4-5	86	94	83	78	72	82 3-5
July 30	84	92	....	....	....	.....	29.98	29.95	.....	.....	.....	.....	83	92	....	....	....	.....
Average	....	....	....	....	....	83	.....	.....	.....	.....	.....	29.75¾	....	....	....	....	....	83¾

Medical Report of Seventy-first Regiment and Tenth Battalion — Meteorological Record — (Concluded).

DATE.	HYGROMETER — WET.					Average daily record.	DIRECTION OF WIND.					Remarks.
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.						
July 23	74	74	74	74	74	74	.....	.....	S. W.	S. W.	S. E.	Showery.
July 24	79	79	80	77	76	78 1-5	S. E.	S. E.	S. E.	S. E.	S.	Showery.
July 25	82	80	79	79	72	78 2-5	S. E.	S. E.	S. E.	S. E.	S.	Clear.
July 26	78	80	76	77	76	87 2-5	S. W.	S. W.	S. W.	S. W.	S. W.	Clear.
July 27	78	80	87	88	86	83 4-5	W.	W.	W.	W.	Calm.	Cloudy and showers.
July 28	82	91	93	88	78	86 2-5	Calm.	Calm.	S.	W.	W.	Storm at 5 P. M.
July 29	86	94	84	77	72	82 3-5	S. E.	S. W.	N. E.	W.	W.	Showers.
July 30	80	86	.....	.....	.....	.....	Calm.	S. W.	.....	.....	.....	Clear.
Average	.....	.....	.....	.....	.....	81 5-8	.....	.....	.....	.....	.....	

I certify that the above report and record are correct.

LEWIS BALCH,

ALBANY, N. Y., *August* 13, 1887. *Major and Surgeon Tenth Battalion, N. G. S. N. Y., Post Surgeon.*

[First indorsement.] — Headquarters Tenth Battalion, N. G. S. N. Y. Albany, N. Y., August 19, 1887. Respectfully forwarded. William E. Fitch, Lieutenant-Colonel commanding Tenth Battalion.

[Indorsed.] — Albany, N. Y., August 13, 1887. Camp of Instruction by Lewis Balch, Post Surgeon. Medical report of service, July 23d to 30th, inclusive.

REPORT OF THE POST SURGEON.

ALBANY, N. Y., *August* 13, 1887.

To the Surgeon-General S. N. Y.:

SIR.—I have the honor to submit the following report of the tour of duty at the Camp of Instruction for the week ending July thirtieth.

Pursuant to G. O. No. 20, c. s. A. G. O., I proceeded to Peekskill, and reported myself to you for duty Saturday morning, July twenty-third. Having had to go to New York city a few days before the twenty-third I asked and received permission from the commanding officer of the Tenth Battalion to precede the command to camp, allowing the hospital steward to have care of any sick that might present themselves during the journey from Albany to camp. There was no need for his services.

Saturday, the twenty-third, with the ambulance, I met the Tenth Battalion at Roa Hook, at 2.10 P. M., and as soon as it had started for camp, the Seventy-first Regiment of New York, Colonel Kopper commanding, reached the dock in the steamboat "Long Branch." Major Marsh, surgeon of the regiment, and Captain Gwyer, assistant surgeon were both with the command. I stated that the ambulance was at their disposal, but there were no sick requiring its use. The weather was rainy and both commands reached camp wet.

Drs. Marsh and Gwyer, having reported to you, were directed to me for assignment to duty. For a detailed statement of the medical duty of the post I respectfully request attention to the inclosed report of Dr. Marsh.

Thursday, the twenty-eighth, leaving camp by the order of the post commander, I turned over to Dr. Marsh the orders received from you, relieving him again on Saturday morning.

Throughout the entire week the weather was most unfavorable, high temperature with great humidity and constant rains being experienced. Considering the amount of work done by the men, and the character of the weather, it is congratulatory to note that out of an average of 631 men daily in camp, but twenty-two had to be excused from duty on account of sickness.

The suggestion made by Dr. Marsh relative to enlarging the bath-house is fully indorsed by me. The baths were found to be a great comfort to the men, and were rarely empty, many waiting a chance to get in. If the number could be supplemented by either extending the present building or erecting another alongside, it would be advantageous to the post.

Owing to the extra drains laid last year, the camp cleared itself much more readily after a rainfall than heretofore. It is respectfully suggested that the camp ground be graded so that the gutters can carry all flow of surface-water to the receiving basins. It is further suggested that the gutters be flagged, the flags to be placed in a flat trough shape, rendering the passage of wheeled vehicles easy. Cobbled gutters would be apt to cause trouble, by reason of the grass that is likely to grow in them.

Dr. Marsh states in his report the sinks to be unsatisfactory. They were found to be so by myself. As you informed me the subject was under advisement as to remedial plans, I have no suggestions to offer, further than that the Legislature be asked for a special appropriation for the sanitary purposes of the camp.

The mess hall and kitchens were well kept, and due care was taken to preserve provisions. The cooking was good, and no fault can be found with the commissariat.

In conclusion, sir, I have but to thank the post commander and the members of the post staff for many kind courtesies. To Doctors Marsh and Gwyer, of the Seventy-first Regiment, my thanks are specially due for valuable aid. Both of these officers proved themselves of a high order of standing in their profession. They had the physical welfare of the two commands always before them, and neglected in no way to care for the health of the camp. Without parade or ostentation, the duty of these officers was so well arranged that at any time, night or day, medical aid could be immediately rendered. I consider it a pleasure to have been associated with them, and respectfully ask your favorable notice of their services.

I have the honor to remain, sir,

Your obedient servant.

LEWIS BALCH,
Major and Post Surgeon.

HEADQUARTERS SEVENTY-FIRST REGIMENT, N. G. S. N. Y.,
MEDICAL DEPARTMENT, *August*, 1, 1887.

Major LEWIS BALCH, *Medical Officer of the Post, State Camp, Peekskill, N. Y.:*

SIR.— I have the honor to inclose, herewith, the consolidated report of the Seventy-first Regiment and Tenth Battalion; also separate consolidated reports, and submit the following report of the tour of duty with the above named commands at the State camp, Peekskill, from July twenty-third to thirtieth, inclusive.

Before leaving for camp, I submitted a number of recommendations to Colonel Kopper, for the benefit of the regiment while at camp, and gave some advice to the members of the command, by means of a circular distributed to all. They are herewith inclosed, marked "Appendix A" and "Appendix B," respectfully.

The regiment left its armory, Broadway and Forty-fifth street, at 11.20 A. M., July twenty-third, in heavy marching order, and proceeded to the foot of Forty-fourth street, North river, where the steamer "Long Branch" was in waiting to convey it to Roa Hook. The regiment speedly embarked, and, at 11.45 A. M., the "Long Branch" headed for the camp. The weather, at the time of "assembly" and during the stay of the regiment in the armory, was close and muggy, and one man was prostrated by the heat, but rallied sufficiently to accompany the regiment. The march to the "Long Branch" was severe, owing to the heat, but no one fell out. Roa Hook was reached at 2.30 P. M., and in a drenching rain the march to the camp was quickly made. The usual ceremonies were observed, and the Seventy-first Regiment entered and took possession of about as wet a camp as any body of men ever entered. The Tenth Battalion of Albany, 196 strong, had arrived earlier in the day.

I reported to you, and routine duties were arranged substantially as follows, viz.: You exercising general supervision as post-surgeon; the medical care of the Seventy-first Regiment and Tenth Battalion devolving on the medical officers of the Seventy-first Regiment, who were also to attend "sick call" at 5.15 A. M.

Owing to the storm dress parade was not held Saturday night. The men turned in on Saturday night in anything but a comfortable condition; the tents and clothing being saturated by the heavy rains of the day and night. Drenching rains continued throughout the night. At "sick call" 5.15 A. M., Sunday, no one reported — a most remarkable occurrence, considering what the men had experienced the previous twenty-four hours. Rain continued during Sunday, day and night; but on Monday morning the weather was clear and warm. A number reported ill; and four, two from the Seventy-first Regiment, and two from the Tenth Battalion were excused from duty, and returned "sick in quarters." These cases were unimportant, and call for no special mention. The men's clothing being still wet, I recommended to Colonel Kopper that the battalion drill, set down for the morning, be omitted, and the morning be devoted to drying the clothing, and getting the camp in order. The recommendation was adopted, and the day was devoted to promoting the comfort of the men. A battalion drill was held in the afternoon.

Quite a number of complaints, such as diarrhœa, colic and constipation now occurred. Colonel Kopper went to see if blouses could not be provided for the men. Through the courtesy of Major-General Porter, the blouses then in store were issued, and were very acceptable, and the men's comfort was greatly increased.

Tuesday was clear and warm, but a south-east breeze made it comfortable. A number reported ill, and two from the Tenth Battalion were excused from duty, and returned one "sick in hospital," and one "sick in quarters. These cases were unimportant. The next morning was cloudy and warm. At "sick call" only one man was excused from duty, and returned as "sick in quarters." The day was very close and hot, the temperature being 98°. Battalion drill was held, and continued the required time. A few from both commands retired, being slightly overcome by the heat; but they required no medications; rest and cool air being all that was necessary.

During battalion and company drills, a medical officer was always present, and could be found, if not on the ground, at a point on the bluff, where he could view both commands. A part of the ambulance corps was also present, but no one knew of their being there, so unostentatiously was the service arranged.

On Wednesday afternoon I was informed that I was to act as post surgeon for the following three days. Agreeable to your instructions, I reported the next morning to the post adjutant for orders.

Battalion drill was held at the usual time, and continued until "recall." Although the morning was warm and close, no one suffered from the effects of the heat As there had been a number of cases of colic, diarrhœa and indigestion, the result of over-feeding, I deemed it advisable to recommend that meat be omitted from the diet list for supper (July twenty-eighth), and boiled rice substituted, and accordingly so recommended on my 10 A. M. report. The diet list was changed in accordance with the recommendation. The wisdom of the measure was apparent, from the fact that no cases due to gastro-intestinal irritation were reported during the night, or at "sick call" the next morning.

At "sick call" Friday morning, a corporal of Company D, Tenth Battalion, severely strained the deep muscles of his back and was excused from duty. At the time of the leaving of his command he had improved very much, but was carried to the station at Roa Hook on a stretcher.

The sanitary inspections were rigidly made. Noticing on the occasions of my visits to the men's sinks that the troughs were very full of fæcal matter and very offensive, I advised Mr. Travers to flush

them oftener than the customary number of times (about seven or eight). He did so, but they still continued full and offensive. On two occasions, I noticed that one particular trough in the men's sinks was entirely dry and contained a large quantity of offensive fæcal matter. This was remedied at once by Mr. Travers, who informed me that he had noticed the same thing on several occasions; and that but slight cause was required, on account of "some defect in the plumbing, to siphon off the water and leave the trough dry."

A drenching rain-storm broke over the camp at 3:45 P. M., lasting nearly three hours. No inconvenience, beyond wetting a few of the men and temporarily flooding the camp, resulted. The drainage being excellent, the streets were soon dried, and the camp was free from remaining water, except on the parade-ground, where large collections of water, almost knee-deep existed, and which caused the wetting of the feet of the band, drum corps and the officers and men of the companies, who had to march through them during the execution of the various movements incidental to the ceremony of dress parade. A proper filling-in, grading and draining of the parade-ground would remedy a condition which always exists after every heavy rain storm.

Five men were in the ambulance that followed the commands on leaving camp; three being members of the Seventy-first Regiment, and two of the Tenth Battalion.

Before being dismissed, two of the men were prostrated on account of the intense heat in the drill room, resulting from the lighted gas.

I desire, in this report, to particularly mention the manner in which the commissary department of the State was managed, and to say that no cause for complaint existed during the week. The food was well cooked, of excellent quality, and more than sufficient in quantity.

The baths now in camp have been of great service to the men, and I do not remember of a single case of skin eruption or chafing that required treatment by the surgeons. On an average about 250 bathed every day, the number could be easily doubled to the advantage of the men.

The most careful supervision was exercised over the men, and everything was done to promote their comfort. The tents after "taps" were examined to see if any of the men had turned in with their clothing on. Any so found were directed to remove their outside clothing. On hot days, after the men had gone to dinner, the tents were examined to see if they contained any sick stowaways. On several occasions men were found who were suffering slightly from the effects of the heat, and who preferred to remain quiet instead of

going to the mess hall. These were directed to go to the bluff, where the cool air speedily improved their condition, and nothing further, in the way of treatment, was required.

A consideration of the consolidated report will show a very light percentage of sickness (2.04 for Seventy-first Regiment, 6.66 for Tenth Battalion, 8.70 for both commands). The disorders prescribed for were few in number, and trivial (with one exception), in character. A glance at the meteorological record will show that the week just passed has been a dangerous one for a body of men to be in camp, on account of the high hygrometric condition of the atmosphere, high temperature and but little wind; for it is with these conditions that sun strokes, prostrations and severe gastro-intestinal disorders are most frequent and dangerous. The fact that 631 men could spend eight days in camp, the daily average temperature being 83 deg. F., and the weather conditions unfavorable, working from early morning until late at night, all their surroundings being entirely different from those to which they have been accustomed, with such a small percentage of sickness, speaks well for the general healthfulness of the location of the camp, the excellence of the sanitary arrangements, the good physique of the men, and the excellent care taken of them by those whose duty it was to look after their welfare. In this connection I wish to mention the valuable support afforded me by my assistant surgeon, Captain Gwyer, and to cheerfully accord to him the praise due him for his untiring attention to those under his medical charge.

It only remains for me to express to you my sincere thanks for the many courtesies extended to me during our official relations, and to acknowledge the courtesy which has been extended to me from all the State officers in camp.

Respectfully submitted.

E. T. T. MARSH, M. D.,

Seventy-first Regiment, N. G. S. N. Y.

APPENDIX "A."

HEADQUARTERS SEVENTY-FIRST REGIMENT, N. G. S. N. Y.,
MEDICAL DEPARTMENT, *July* 15, 1887.

The Commanding Officer of the Seventy-first Regiment, N. G. S. N. Y.:

SIR.—The following recommendations are made for the benefit of this command, while at the State Camp of Instruction, Peekskill, N. Y., from July twenty-third to the thirtieth, inclusive.

Respectfully.

E. T. T. MARSH, M. D.,
Major and Surgeon.

First. That no hard work should be commenced until an hour after meals.

Second. That at least three hours elapse between the last meal and "retreat."

Third. That if the heat should be excessive, battalion drill should commence an hour after breakfast, instead of at a later hour, and continuing until noon; by so doing there would be less danger of the men being prostrated by the heat, and the drill could be brought to a finish without cutting it short. The company drills could be held at the time set down for the battalion drill, and the number of the men being smaller, advantage could be taken of the shade afforded by the trees around the parade-ground.

Fourth. That drill officers should give their men frequent rests during the excessively hot weather, at which time they should be allowed to remove their helmets or caps, and open their coats.

Fifth. That drill officers should carefully notice the condition of the men while drilling, and if any be noticed with pale countenances, he should be ordered to "fall out" at once, and be taken to a shady place and placed in a recumbent position, with head a little lower than the body, the clothing being opened and all bands loosened; word should be sent at once to the surgeons.

Sixth. That company servants should be directed to mix oatmeal or ginger with the water supplied to the men for drinking purposes. They should not be allowed to carry iced lemonade in their pails, as has been done on parades.

Seventh. That bathing should be permitted and encouraged. On account of the inconvenience, distance and liability to accident, swimming in the river should not be permitted. The men can bathe all that is necessary in the bath-houses now existing at the camp.

APPENDIX "B."

HEADQUARTERS SEVENTY-FIRST REGIMENT, N. G. S. N. Y.,
MEDICAL DEPARTMENT, *July* 15, 1887.

The Commanding Officer of the Seventy-first Regiment, N. G. S. N. Y.:

SIR.—I deem it eminently proper at this time (the regiment having been ordered to the State camp at Peekskill, N. Y.,) to offer some advice to the members of the Seventy-first Regiment, and I do so by means of the accompanying suggestions.

The members of this command should bear in mind that they are going to a camp noted for its great healthfulness, where they will be well fed and well taken care of, and they should coöperate with the surgeon in keeping the sickness down to a minimum; this they can do if they will only pay attention to common-sense facts.

Respectfully.

E. T. T. MARSH, M. D.,
Major and Surgeon Seventy-first Regiment, N. G. S. N. Y.

That all members of this command wearing trusses, should before going to camp, see that they are in good repair and properly adjusted.

That all members of this command who suffer from frequent attacks of looseness of the bowels should wear a light flannel band around the waist during their stay in camp.

That the men should provide themselves with the proper kind of boots or shoes, low heels, sole as broad as the foot when the weight of the body is resting upon it, and long enough to allow of the full play of the foot in walking; pointed shoes should not be worn.

That the men should not wear collars, or anything tight about the neck, and the rest of the clothing should be free and loose.

That the men should wear a folded wet cloth in the crown of the fatigue cap or helmet when exposed to the intense heat of the sun.

That the men should avoid the immoderate use of ice water, especially when overheated and at rest, or when the body is commencing to cool; violent cramps, purging and vomiting are apt to follow in consequence and immediate death has been known to occur.

That the men should remember that moderately cold water is the most grateful to the stomach and allays thirst better than any other fluid; ale, beer and the spirituous liquors are the worst of all, and their use during the tour of duty in camp should be rigidly avoided.

That the men should avoid eating unripe fruit of all kinds. That the men should bathe daily; by so doing skin eruptions and chafing

are prevented, or rendered less frequent. The feet should be carefully looked after and bathed; blistered feet will be less frequent if this is done. Sufficient time should be allowed for the feet to dry before putting on the stockings after bathing, as they are liable to be quickly blistered if active exercise is taken while the skin is still soft from the recent use of water, and the stockings are damp. Cold baths should not be taken immediately before or after a meal.

That the men should remember that exposure to a draught when overheated, which cools the body too suddenly, is exceedingly dangerous.

That the men should wear their suits of underclothing on alternate days, thereby allowing each suit to become thoroughly dried and aired before being worn again.

All who are unaccustomed to strong coffee are advised to dilute that served in camp largely with milk, otherwise they are liable to suffer from diarrhœa.

[Indorsed.] Headquarters Seventy-first Regiment, N. G. S. N. Y., Medical Department, New York, August 1, 1887. E. T. T. Marsh, major and surgeon. Report of tour of duty at State camp, Peekskill, N. Y., July twenty-third to thirtieth. Headquarters Seventy-first Regiment, N. G. S. N. Y., New York, August 2, 1887. Respectfully forwarded, approved, Frederick Kopper, Colonel commanding Seventy-first Regiment, N. G. S. N. Y.

[Second indorsement.] Albany, N. Y., August 13, 1887. Respectfully forwarded, approved, Lewis Balch, major and post surgeon.

[Third indorsement.] Headquarters Tenth Battalion, N. G. S. N. Y., Albany, N. Y., August 19, 1887. Respectfully forwarded, William E. Fitch, Lt.-Colonel commanding Tenth Battalion.

(G.)

REPORT OF THE SURGEON OF THE TWENTY-SECOND REGIMENT.

New York, *August* 16, 1887.

The Surgeon-General State of New York:

Sir.— I have the honor to submit the following report:

On arrival of my regiment at camp, July thirtieth, obedient to General Orders No. 20, I reported for duty as post surgeon, relieving Major Lewis Balch. There were two organizations present, the Twenty-second Regiment and Second Battery, numbering 628 men.

Major Balch, who had been assigned, accompanying the regiment on its march, kindly volunteered to serve with it during the encampment, and Captain Sims, the assistant surgeon, being absent on leave, Assistant Surgeon J. A Brucklow reported for duty with the battery.

The camp ground had been well policed by the out-going organiations, and was free from litter. This condition was maintained by both organizations. The water supply was abundant, and good in quality. School sinks and a water closet system, and shower baths, were the noticable improvements. The former were badly constructed and very defective, but when altered to meet the design originally intended, will answer the wants of the place. Bad workmanship should not be allowed to condemn a system which works perfectly elsewhere. Sufficient money should be appropriated to correct this glaring evil, before another summer. The shower baths proved very useful and grateful to the men, and assisted greatly in keeping down heat eruptions and similar skin disorders, so common in former summers. The commissary department maintained its usual efficient condition, and no fault could be found with it in any particular. The accompanying tabulated report is worthy of notice, in connection with the marching of the Twenty-second to the camp. It shows the smallest number of sick in the history of the regiment in its camp tours — seventeen. Of this number, three only can trace their diseases to the march, and of this three only two were relieved from duty. Again, in two of them the fault was due to a violation of instructions

given before the march, in a failure to select the right kind of a shoe, so that blistering and ulceration resulted. The health of the battery was excellent, and were it not for the accident occurring the last night in camp, its sick report would have been blank.

Respectfully your obedient servant.

W. F. DUNCAN,
Major and Post Surgeon.

REPORT OF THE POST SURGEON STATE CAMP, ETC., JULY 30, TO AUGUST 6, 1887. TOUR OF SERVICE TWENTY-SECOND REGIMENT AND SECOND BATTERY.

HEADQUARTERS TWENTY-SECOND REGIMENT,
N. G. S. N. Y.,
NEW YORK, *August* 16, 1887.

Colonel JOHN T. CAMP,
Commanding Twenty-second Regiment, N. G. S. N. Y.:

SIR.—I have the honor to submit the following report, relating to the medical department of the regiment from July 28 to August 6, 1887.

This must naturally be divided into two parts, one descriptive of the medical work on the march and the other in camp.

It is not my intention to give a minute history of the march and I shall content myself, and hope to fulfill my duty, in restricting myself to generalizations. The preparations for the undertaking was simple enough, consisting of a small one-horse express wagon, for ambulance purposes and carrying of supplies and a hospital haversack. Two members of the regimental ambulance corps were detailed, under supervision of Hospital Steward Benedict, to accompany the wagon. Thursday evening the men marched about twelve miles and on arrival at the place of bivouac were in good condition.

A halt of ten or twelve minutes in each hour was made and one of a longer period at 6 P. M., for feeding purposes. The night was clear and atmosphere dry. The camp site was well selected, being on high, dry ground and covered with light sward. Little sleep was obtained, owing to the noise and careless chatter of a few thoughtless members, and all at reveille were unrefreshed.

The march was resumed about 5 A. M., under unfavorable circumstances; the air being very humid and the temperature high. Loss of sleep and lack of food began to effect the command by 11 o'clock; then a prolonged halt was made and beef juice and red wine were served to all. The effect of rest and food was magical, the men picked up in spirits and strength and took up the march with renewed zeal.

A long halt of five hours was made at Croton river in which the men were allowed, after judicious interval, to bathe and swim. Up to this time the ambulance had been used merely as a supply wagon and not a sick soldier was on the list; occasionally a man would drop out for half an hour, showing slight effects of the heat, and would patronize the ambulance. A word of encouragement and the use of a little stimulants served to make a good soldier of him again.

At the noon halt milk and bread were supplied in abundance and a fortunate thing it was for a severe test of endurance was about to come. A succession of severe thunder, wind and rain showers set in at 4 o'clock and continued without cessation till 8. Every man became wet through in spite of the rubber ponchos, and on arrival at the point selected for the second bivouac a choice had to be made between camping in wet clothing in a field whose grass and soil were saturated with water or to continue the march several miles further to Peekskill where we were promised the shelter of a house by Captain Finch. The latter alternative was chosen and the march continued. Even now the wagon did not fill with sick men, but it was wisely utilized by Dr. Balch, who brought up the rear, in giving well-timed aid to those to whom the strain was becoming too severe. On my arrival at the Finch mansion, 2.40 P. M., I arranged a sick bay, and four or five men found the needed rest and quiet there that was necessary.

Coffee and bread, and meat, were served at 9 P. M., and at tattoo a ration of whisky and quinine was given to all. Saturday morning before reveille all were up and about, the hospital room was emptied of the so-called sick, of the night before, and soon after getting a ration of bread and milk, the command was under way, sound in body and limb, and contented in mind.

Four hundred and thirty-seven men left Yonkers with the regiment and all but eight (8) marched into camp. The eight were stragglers or skulkers and deserve the contempt of the command. My claim that the march did not injure the men in any particular is substantiated by a reference to the accompanying tabulated sick report of the week in camp which shows not one person ill enough to go into the hospital for the first six days.

Again, and this will be the only reference I shall make to the week in camp, the sick report contains a smaller number of names for the same number of days than in any previous encampment. The advantages of the march, to my particular department were very great, furnishing a kind of instruction to be obtained in no other way. It set into practical operation a theoretical machine in which weak

points were detected, to be thrown out in future, and good ones seen, which will be preserved for use in time to come.

The ambulance corps which had been organized and instructed a few days before the march, did efficient service when called on, and will in time be a credit to the organization.

I wish to express my thanks to Major Balch, detailed to associate with me the ten days of our tour, and to state that he commands my respect as a gentleman and an efficient soldier.

Very respectfully, your obedient servant.

W. F. DUNCAN,

Major and Surgeon, Twenty-second Regiment.

Medical Report of Twenty-second Regiment and Second Battery, N. G. S. N. Y., from July 30 to August 6, 1887.

DATE.	Number prescribed for daily.	Number of prescriptions written daily.	Number of men in hospital.	Number ill in quarters.	Number excused from duty on account of illness.	Number in camp daily.	Per cent prescribed for daily.	DISORDERS FOR WHICH MEDICINES WERE DISPENSED.																
								Laryngitis.	Severe blister of foot.	Enuresis.	Malaria.	Gonorrhœa.	Hemorrhoids.	Cold.	Febricula.	Odontalgia ulcer.	Ulcer of ankle.	Diarrhœa.	Ivy poisoning.	Incised wound of lip.	Fracture, two ribs, left.	Phthisis.	Total.
July 30*	3	5	....	3	1	628	.0047	1	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	3
July 31*	6	13	....	6	2	632	.0094	....	....	....	1	2	1	1	1	....	....	....	....	....	....	....	....	6
August 1*	2	8	....	2	.....	637	.0031	....	....	....	....	1	....	....	....	1	....	....	....	....	....	....	....	2
August 2*	6	7	....	6	2	622	.0031	....	....	....	....	....	....	....	....	....	1	2	2	....	....	1	6
August 3	....	4	....	....	.....	610	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
August 4	....	....	....	....	.....	605	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
August 5	....	1	....	2	2	613	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
August 6†	2	2	1	....	1	610	.0032	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	2
Total	19	40	1	19	8	4,957	.0235	1	1	1	1	3	1	1	1	1	1	2	2	1	1	1	19
Average	....	....	....	....	.....	619.1	.0029	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....

* Regiment. † Battery.

Medical Report of the Twenty-second Regiment and Second Battery — Meteorological Record — (Continued).

DATE.	Temperature Record.					Average daily record.	Barometrical Record.					Average daily record.	Hygrometer — Dry.				Average daily record.
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	9 P. M.	10 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	
1887.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.							Deg.	Deg.	Deg.	Deg.	Deg.
Saturday, July 30...	.....	.....	96	87	78	87.0	.....	.....	29.9	29.9	29.9	29.9	.....	....	86	86	86
Sunday, July 31...	90	91	75	74	72	80.4	29.9	29.9	29.9	29.9	29.9	29.9	90	91	78	78	84.25
Monday, Aug. 1...	83	92	90	86	79	86.0	29.9	29.9	29.9	29.9	29.9	29.9	83	93	90	87	88.25
Tuesday, Aug. 2...	90	95	82	78	70	83.0	29.9	29.9	29.9	29.9	29.9	29.9	90	96	83	79	87
Wednesday, Aug. 3...	85	90	94	82	78	85.8	30	30	30	30	30	30	84	92	94	82	88
Thursday, Aug. 4...	78	92	89	84	70	82.6	31	31	30.0	31	31	31	80	91	88	82	85.25
Friday, Aug. 5...	84	87	80	76	72	79.8	30	30	30.0	29.9	29.9	29.96	84	86	81	77	82
Saturday, Aug. 6...	87	74	.....	....	.....	80.5	29.8	29.8	.....	.....	.....	29.8	87	74	.....	.....	80.5
Average.....	85.28	88.71	86.57	81.0	74.14	83.13	30.07	30.07	30.08	30.07	30.07	30.04	85.42	89	85.71	81.57	85.15

Medical Report of the Twenty-second Regiment and Second Battery — Meteorological Record — (Concluded).

DATE.	HYGROMETER — WET.				Average daily record.	DIRECTION OF WIND.					Remarks.
	9 A. M.	12 M.	3 P. M.	6 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	
1887.	Deg.	Deg.	Deg.	Deg.	Deg.						
Saturday, July 30	.....	.....	86	86	86.0	.....	.....	Calm.	N. E.	S. W.	Cloudy, clear.
Sunday, July 31	90	92	78	78	84.5	Calm.	S. W.	N. W.	Calm.	Calm.	Clear, clear, rain, clear.
Monday, Aug. 1	83	93	91	87	88.5	Calm.	S. W.	Calm.	Calm.	Calm.	Clear, clear, cloudy.
Tuesday, Aug. 2	90	97	83	79	87.25	Calm.	Calm.	Calm.	Calm.	Calm.	Fair, cloudy.
Wednesday, Aug. 3	77	90	96	82	86.25	N. W.	N. W.	S. W.	S. E.	Calm.	Fair, cloudy.
Thursday, Aug. 4	80	92	90	83	86.25	Calm.	Calm.	Calm.	Calm.	Calm.	Cloudy, fair, cloudy.
Friday, Aug. 5	86	88	81	77	83.0	S. E.	S. E.	S. E.	S. E.	S. E.	Cloudy, clear, rain.
Saturday, Aug. 6	88	75	.....	.....	81.5	S. W.	S.	.....	.....	.....	Cloudy, rain.
Average	84.85	89.57	86.42	81.71	85.40	.....	.....	.....	.....	.....	

I certify that the above report and record are correct.

WM. F. DUNCAN,

Major and Post Surgeon.

NEW YORK, N. Y., *August* 16, 1887.

[Indorsed.] New York city, N. Y., August 16, 1887. Report of tour of service at State camp, near Peekskill, N. Y. By W. F. Duncan, Major and Post Surgeon. Medical report of service, Twenty-second Regiment and Second Battery, N. G. S. N. Y., July 30 to August 6, 1887.

Medical Report of Twenty-second Regiment, N. G. S. N. Y., from July 30 to August 6, 1887.

DATE.	Number prescribed for daily.	Number of prescriptions written daily.	Number ill in quarters.	Number excused from duty on account of illness.	Number in camp daily.	Per cent prescribed for daily.	Disorders for which Medicines were Dispensed.													
							Laryngitis.	Severe blister of foot.	Enuresis.	Malaria.	Gonorrhœa.	Hemorrhoids.	Cold.	Febricula.	Odontalgia ulcer.	Ulcer of ankle.	Diarrhœa.	Ivy poisoning.	Phthisis.	Total.
July 30	3	4	3	1	551	.0054	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
July 31	6	13	6	2	555	.0114	.....	.....	.....	1	2	1	1	1	.....	.....	.....	.....	.....	6
August 1	2	8	2	.....	557	.0035	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	2
August 2	6	7	6	2	543	.0011	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	2	1	6
August 3	....	4	....	.....	531	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
August 4	....	....	....	.....	526	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
August 5	....	..	....	.....	534	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
August 6	...	....	....	.....	532	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	17	36	17	5	4.329	.0114	1	1	1	1	3	1	1	1	1	1	2	2	1	17
Average	2.12	4	2.12	.06	616	.0014	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.12

Medical Report of Twenty-second Regiment — Meteorological Record — (Continued).

DATE.	TEMPERATURE RECORD.						BAROMETRICAL RECORD.						HYGROMETER — DRY.				
	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	Average daily record.	9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	Average daily record.	9 A. M.	12 M.	3 P. M.	6 P. M.	Average daily record.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.							Deg.	Deg.	Deg.	Deg.	Deg.
July 30	.....	.....	96	87	78	87	.....	.....	29.9	29.9	29.9	29.9	.....	....	86	86	86
July 31	90	91	75	74	72	80.4	29.9	29.9	29.9	29.9	29.9	29.9	90	91	78	78	84.2
August 1	83	92	90	86	79	86	29.9	29.9	29.9	29.9	29.9	29.9	83	93	90	87	88.2
August 2	90	95	82	78	70	83	29.9	29.9	29.9	29.9	29.9	29.9	90	96	80	79	87
August 3	85	90	94	82	78	85.8	30	30	30	30	30	30	84	92	94	82	88
August 4	78	92	89	84	70	82.6	31	31	31	31	31	31	80	91	88	82	85.2
August 5	84	87	80	76	72	79.8	30	30	30	29.9	29.9	29.96	84	86	81	77	82
August 6	87	74	.....	....	.....	80.5	29.8	29.8	.....	.....	.....	29.8	87	74	.....	.....	80.5
Average	85.28	88.71	86.57	81	74.14	83.13	30.07	30.07	30.08	30.07	30.07	30.04	85.42	89	85.71	81.57	85.15

Medical Report of Twenty-second Regiment — Meteorological Record — (Concluded).

DATE.	HYGROMETER—WET,				Average daily record.	DIRECTION OF WIND.					Remarks.
	9 A. M.	12 M.	3 P. M.	6 P. M.		9 A. M.	12 M.	3 P. M.	6 P. M.	10 P. M.	
	Deg.	Deg.	Deg.	Deg.	Deg.	.....	.....	Calm.	N. E.	S. W.	Cloudy, clear.
July 30	.....	.....	86	86	86	S. W.	N. W.	Calm.	Calm.	Calm.	Clear, clear, rain, clear.
July 31	90	92	78	78	84.5	Calm.	S. W.	Calm.	Calm.	Calm.	Clear, clear, cloudy.
August 1	83	93	91	87	88.5	Calm.	Calm.	Calm.	Calm.	Calm.	Clear, cloudy.
August 2	90	97	83	79	87.2	N. W.	N. W.	S. W.	S. E.	Calm.	Clear, cloudy.
August 3	77	90	96	82	86.2	Calm.	Calm.	Calm.	Calm.	Calm.	Cloudy, clear, cloudy.
August 4	80	92	90	83	86.2	S. E.	S. E.	S. E.	S. E.	S. E.	Cloudy, rain.
August 5	86	88	81	77	83	S. W.	S.	.....	.....	.....	Cloudy, rain.
August 6	88	75	.....	.....	81.5						
Average ...	84.9	89.5	86.4	81.7	85.40	.....	.....	.....	.....	.....	

I certify that the above report and record are correct.

WM. F. DUNCAN,

Major and Surgeon, Twenty-second Regiment, N. G. S. N. Y.

NEW YORK, N. Y., *August* 16, 1887.

[First indorsement.] Headquarters Twenty-second Regiment, N. G. S. N. Y. West Fourteenth street, New York, September 17, 1887. Respectfully forwarded. Jno. T. Camp, Colonel.

[Indorsed.] New York City, N. Y., August 16, 1887. Report of tour of service at State camp, near Peekskill' N. Y., by Wm. F. Duncan, Major and Surgeon. Medical report of service, Twenty-second Regiment, N. G. S. N. Y., July 30 to August 6, 1887.

(H.)

REPORT OF THE ACTING PAYMASTER-GENERAL.

GENERAL HEADQUARTERS, STATE OF NEW YORK,
ADJUTANT GENERAL'S OFFICE, ALBANY, *December* 31, 1887.

PAY DEPARTMENT.

The Adjutant-General, State of New York:

SIR.— Having been detailed by Section II, Special Orders No. 49, c. s., A. G. O., S. N. Y., June 10, 1887, as acting paymaster-general, for the purpose of paying the troops ordered to the Camp of Instruction during the season of 1887; and also by Section III, Special Orders No. 84, c. s., A. G. O., S. N. Y., September 28, 1887, for the purpose of paying the troops ordered to Philadelphia by Special Orders Nos. 77 and 78, c. s., A. G. O., I have the honor to report:

Amount received from State Treasurer, upon requisitions drawn by me on the Comptroller, under section 70, Military Code:

Camp detail	$53,000 00
Philadelphia detail	15,000 00
Total	$68,000 00

The expenditures were as follows:

Camp Detail.

Seventh Regiment		$7,844 25
Twelfth Regiment	$6,157 00	
Seventeenth Separate Company	365 00	
Thirty-fifth Separate Company	688 75	
		7,210 75
Ninth Regiment	$4,474 25	
First Provisional Battalion, field and staff	140 00	
Sixth Separate Company	859 50	
Eleventh Separate Company	427 50	
Thirty-eighth Separate Company	558 75	
Forty-first Separate Company	606 50	
		7,066 50

Forty-seventh Regiment	$3,852 00	
Second Provisional Battalion, field and staff	144 00	
Fifth Separate Company	714 50	
Nineteenth Separate Company	885 75	
Twentieth Separate Company	628 75	
Sixth Battery	623 50	
		$6,848 50
Twenty-third Regiment		4,502 50
Seventy-first Regiment	$4,581 50	
Tenth Battalion	2,219 00	
		6,800 50
Twenty-second Regiment	$5,120 50	
Second Battery	844 25	
		6,964 75
Post staff		1,911 75
Band allowance		3,500 00
Expenses, etc., pay department		291 37
		$52,940 87

Philadelphia Detail.

Brigadier General Louis Fitzgerald and staff		$54 75
Twelfth Regiment		769 50
Twenty-second Regiment		525 50
Twenty-third Regiment		722 75
Colonel E. F Gaylor and staff	$160 50	
Second Separate Company	289 50	
Eighth Separate Company	216 75	
Nineteenth Separate Company	87 50	
Twentieth Separate Company	280 50	
Twenty-second Separate Company	177 00	
Twenty-sixth Separate Company	513 00	
Thirtieth Separate Company	304 00	
Thirty-second Separate Company	289 50	
Thirty-fifth Separate Company	333 00	
Thirty-ninth Separate Company	231 75	
Forty-first Separate Company	236 25	
Detachment from Twenty-seventh Separate Company	59 00	
Forty-seventh Regiment drum corps	26 25	
		3,202 50
Expenses, etc., pay department		133 50
		$5,408 50
Leaving a balance to my credit of		$9,650 63

Having been detailed by special orders No. 109½, c. s., A. G. O., S. N. Y., December 17, 1887, as Acting Paymaster-General, until further orders, I have received from Brigadier-General Lloyd S. Bryce, Paymaster-General, resigned, the following:

Proclamation, Governor Morgan bounty fund	$575 00
Chapter 184, Laws of 1863, bounty fund	20 00
July (1887) riots, absentee fund	815 00
National Guard, service fund	1,628 05
Total	$3,038 05

Leaving a total balance in my hands of $12,688.68, which is distributed as follows:

Proclamation Governor Morgan, bounty fund	$575 00
Chapter 184, Laws of 1863, bounty fund	20 00
July (1887), riots, absentee fund	815 00
National Guard, services fund	11,278 68
Total	$12,688 68

Of this amount $1,410 is deposited in the New York State National Bank of Albany, and $11,278.68 in the National Commercial Bank of Albany.

I have the honor to be,

Very respectfully, your obedient servant.

EDMUND L. JUDSON, 2d,
Colonel and Acting Paymaster-General.

(I.)

REPORT OF THE GENERAL INSPECTOR OF RIFLE PRACTICE FOR 1887.

STATE OF NEW YORK:

DEPARTMENT OF RIFLE PRACTICE,
OFFICE NO. 8 COENTIES SLIP, NEW YORK CITY.

The Adjutant-General State of New York:

SIR.—In making report for the year 1887 I have but little change to note, except a general feeling of increased interest, as exemplified in the tables accompanying. Following out your instructions, I early in the year visited and addressed upon the subject of rifle practice the officers of each organization in the State, and I think the result was beneficial, though the growth of such thoughts as I was enabled to impart is necessarily slow. I still hold to the idea that a more extended knowledge on the part of officers is what is most needed, and hope to see more effort to gain such knowledge. Perhaps it may best be gained by teaching those who are to be our future officers, and thus lay the foundation so deeply that it may grow from small to great degree by same process as we now educate the men for positions, in tactics and other matters of a soldier's duty.

The preliminary or so called free practice instituted under your directions early in May, and continued during the season, has had very beneficial effect, especially in First and Second Brigades, where most attention was paid to it. By a generous issue of ammunition, the principle of the practice may be had by all the troops, and I trust this may be allowed, and a further impetus be given the coming season.

At Creedmoor there were nearly twelve hundred (1,200) separate individuals practiced, many of them several times. At Buffalo about two hundred (200), and at Rensselaerwyck but few. The great gain

in marksmen in First and Second Brigades can, I think, be largely attributed to this practice. For instance:

REGIMENT.	FREE PRACTICE.	MARKSMEN.		Gain.
	Men.	1886.	1887.	
Seventh Regiment	121	640	864	224
Eleventh Regiment	123	31	106	75
Thirteenth Regiment	113	173	296	123
Twenty-second Regiment	102	96	150	54
Twenty-third Regiment	126	308	456	148
Sixty-ninth Regiment	151	69	245	176

And the gain is proportionately about the same in those who practiced, less than 100 men, during the free practice.

This year I would recommend about twelve (12) days free practice in the early part of the season, and not to continue after or during the later months. This, from the experience of last season, would be the best.

In the State at large the marksmen have increased 1,082. Third class (those who do not practice) have decreased 152; in other words, we practiced about 250 more men than in 1886.

In volley and skirmish, the increase in proficiency has been very marked, the percentage being 53.70, as against 50.09 in 1886.

Following please find the

STATE FIGURE OF MERIT.

4,728 Marksmen x 100=472,800
1,585 1st Class x 60= 95,100
1,001 2d Class x 20= 20,020
4,419 3d Class

11,733 Inspected..11,733)587,920(Individual figure of merit..... 50.10

4,782 Volley and skirmish,4,568

	Possible.	Actual score.	
4,675 Men x 25	116,875	627,695	Figure merit, volley and skirmish, 53.70

Total..... 103.80

Number practicing, 7,314, general figures (or ½), is..... 51.90

PROFICIENCY TABLES.

By Brigades.

Order of merit.	ORGANIZATION.	Inspection.	Practicing.	Marksmen.	Classes.			Figure of Merit.		
					First.	Second.	Third.	Volley and skirmish.	Individual.	General.
1	Third	2,262	1,538	1,037	335	166	724	57.67	56.19	56.93
2	Fourth	1,711	857	639	165	53	854	64.87	43.75	54.31
3	Second	2,579	1,645	1,145	382	218	834	51.98	54.98	53.48
4	First	5,159	3,152	1,887	701	564	2,007	49.04	46.91	47.98

By Regiments.

1	Seventh Regiment	1,014	977	864	83	30	37	66.68	90.71	78.70
2	Twenty-third Regiment	664	549	456	74	19	115	55.53	75.93	65.73
3	Thirteenth Regiment	512	387	296	59	32	125	58.18	65.97	62.08
4	Seventy-fourth Regt.	338	143	122	15	6	195	68.28	39.11	53.70
5	Tenth Battalion	246	150	106	34	10	96	52.47	52.19	52.33
6	Sixty-fifth Regiment	429	220	158	49	13	209	58.99	44.29	51.64
7	Forty-seventh Regim'nt	438	314	131	107	76	124	46.09	48.04	47.07
8	Twenty-second Regt.	572	331	150	105	76	241	53.68	39.90	46.79
9	Twelfth Regiment	654	404	197	110	97	250	47.26	43.18	45.22
10	Thirty-second Regt.	399	217	82	83	52	182	44.30	35.64	39.97
11	Fourteenth Regiment	502	215	122	56	37	287	45.54	32.47	39.01
12	Eighth Regiment	413	185	92	54	39	228	43.45	32.01	37.73
13	Ninth Regiment	539	272	124	91	57	267	39.80	35.25	37.53
14	Sixty-ninth Regiment	888	422	245	95	82	468	34.19	35.86	35.03
15	Seventy-first Regiment	546	255	99	78	78	291	38.07	29.56	33.82
16	Eleventh Regiment	521	296	106	35	105	225	31.20	34.16	32.68

By Companies.

1	B, 7th Regiment	101	117	110	5	2	.....	70.71	112.27	91.49
2	Eighteenth Separate	45	52	49	2	1	.....	67.01	112.00	89.51
3	F, 7th Regiment	101	105	102	3	....	.....	76.18	102.77	89.48
4	I, 23d Regiment	69	75	75	....	....	.....	68.06	108.70	88.38
5	K, 7th Regiment	101	104	91	11	2	.....	70.81	97.03	83.92
6	I, 7th Regiment	101	105	92	11	2	.....	68.53	98.02	83.28
7	Second Separate	77	75	71	3	1	2	68.20	94.80	81.50
8	Seventeenth Separate	22	53	48	3	2	.....	65.03	96.54	80.79
9	C, Seventh Regiment	101	90	83	5	2	11	74.57	85.54	80.06
10	H, 7th Regiment	101	93	81	8	4	8	70.82	85.74	78.28
11	Seventh Separate	67	68	58	6	4	.....	58.88	93.13	76.01
12	K, 13th Regiment	48	44	42	1	1	4	62.80	89.16	75.98
13	I, 13th Regiment	41	40	39	....	1	1	56.11	95.61	75.86
14	Thirty-ninth Separate	87	67	61	5	1	20	77.44	73.80	75.62
15	Sixth Separate	102	87	80	7	....	15	62.84	82.55	72.69
16	Twenty-sixth Separate	94	80	61	14	5	14	70.30	74.90	72.60
17	D, 23d Regiment	56	51	37	12	2	5	65.38	79 64	72.51
18	A, Seventh Regiment	101	94	76	14	4	7	60.13	84.35	72.24
19	F, 74th Regiment	43	30	26	2	2	13	80.08	64.19	72.14
20	Thirtieth Separate	70	62	48	11	3	8	64.49	78.86	71.68
21	Ninth Separate	34	26	24	2	....	8	67.25	74.12	71.19
22	E, 7th Regiment	94	73	67	4	2	21	68.11	74.25	71.18
23	Twentieth Separate	82	79	41	34	4	3	65.26	75.85	70.56
24	G, 7th Regiment	101	97	78	14	5	4	54.27	86.53	70.40
25	Thirty-third Separate	67	63	44	12	7	4	61.87	78.51	70.19
26	Forty-second Separate	100	94	55	30	9	6	63.97	74.80	69.38
27	Thirty-fourth Separate	55	49	37	6	6	6	81.56	76.00	68.78

BY COMPANIES — *(Continued).*

Order of merit.	ORGANIZATION.	Inspection.	Practicing.	Marksmen.	CLASSES.			FIGURE OF MERIT.		
					First.	Second.	Third.	Volley and skirmish.	Individual.	General.
28	B, 23d Regiment	60	49	42	6	1	11	58.69	76.33	67.51
29	A, 23d Regiment	82	72	60	10	2	10	53.83	80.98	67.41
30	D, 7th Regiment	93	82	69	6	7	11	54.84	79.57	67.20
31	D, 13th Regiment	42	37	29	3	5	5	58.54	75.71	67.13
32	F, 23d Regiment	67	59	48	8	3	8	53.00	78.70	11.35
33	Twenty-seventh Sep'ate	62	58	31	21	6	4	59.42	72.26	65.84
34	Third Separate	88	84	48	24	12	4	57.38	73.63	65.51
35	C, 23d Regiment	58	53	46	4	3	5	45.87	84.48	65.18
36	Fourth Separate	62	52	31	15	6	10	61.00	66.45	63.73
37	Fourteenth Separate	72	54	42	7	5	18	61.71	65.55	63.63
38	G, 13th Regiment	72	53	44	7	2	19	59.72	67.50	63.61
39	F, 22d Regiment	36	28	19	7	2	8	60.46	65.55	63.01
40	Twenty-third Separate	64	35	33	1	1	29	71.28	52.81	62.05
41	H, 23d Regiment	61	49	36	12	1	12	52.61	71.05	61.83
42	Twenty-ninth Separate	62	42	21	17	4	20	71.53	51.61	61.57
43	B, 13th Regiment	45	36	25	9	2	9	54.25	68.44	61.35
44	F, 65th Regiment	49	36	28	6	2	13	57.29	65.31	61.30
45	Thirty-second Separate	75	66	62	2	2	9	37.61	84.80	61.21
46	F, 47th Regiment	55	47	27	12	8	8	57.00	65.09	61.05
47	B, 74th Regiment	52	25	23	2	....	27	75.20	46.54	60.87
48	A, 13th Regiment	48	33	23	7	3	15	62.38	57.92	60.15
49	First Separate	52	31	24	6	1	21	65.21	53.46	59.34
50	B, 10th Battalion	58	41	36	4	1	17	50.21	66.55	58.38
51	C, 13th Regiment	55	43	23	11	9	12	56.84	57.09	56.97
52	A, 10th Battalion	65	47	29	14	4	18	54.55	58.77	56.66
53	Nineteenth Separate	100	67	49	11	7	33	56.24	57.00	56.62
54	E, 23d Regiment	57	42	32	7	3	15	47.80	64.56	56.18
55	K, 47th Regiment	62	50	25	17	8	12	51.37	59.35	55.86
56	C, 69th Regiment	87	66	63	1	2	21	38.09	73.56	55.78
57	B, 12th Regiment	51	35	21	11	3	16	55.82	55.30	55.56
58	A, 65th Regiment	44	19	17	2	....	25	69.66	41.36	55.51
59	Thirty-eighth Separate	66	27	23	3	1	39	72.87	37.88	55.38
60	B, 65th Regiment	60	37	29	6	2	23	55.55	55.00	55.28
61	H, 13th Regiment	48	27	18	7	2	21	62.26	47.08	54.67
62	G, 23d Regiment	64	37	30	7	....	27	55.14	53.44	54.29
63	K, 23d Regiment	73	46	34	8	4	27	54.30	54.25	54.28
64	F, 13th Regiment	47	32	30	9	3	15	51.62	55.32	53.47
65	G, 65th Regiment	48	16	15	1	....	32	74.00	32.50	53.25
66	Tenth Separate	52	33	20	8	5	19	26.82	49.61	53.22
67	Thirty-seventh Separ'te	57	43	30	7	6	14	43.60	62.10	52.55
68	C, 11th Regiment	39	29	18	10	1	10	43.16	62.05	53.61
69	Sixteenth Separate	61	32	19	11	2	29	62.15	42.62	52.39
70	Thirty-fifth Separate	73	48	33	13	2	25	47.08	56.44	51.76
71	K, 14th Regiment	48	35	21	10	4	13	45.49	57.91	51.70
72	I, 65th Regiment	52	34	13	16	5	18	56.92	45.38	51.65
73	D, 65th Regiment	54	28	23	1	4	26	57.30	45.19	51.25
74	H, Ninth Regiment	53	39	22	13	4	14	44.51	57.73	51.12
75	D, 12th Regiment	97	62	41	14	7	35	49.08	52.37	50.73
76	E, 13th Regiment	50	28	19	5	4	22	54.21	45.60	49.91
77	H, 65th Regiment	54	26	15	11	....	28	59.51	40.00	49.76
78	E, 74th Regiment	47	15	14	1	....	32	67.71	31.06	49.39
79	E, 47th Regiment	38	27	5	13	9	11	59.33	38.42	48.88
80	C, 10th Battalion	56	28	19	8	1	28	54.28	42.86	48.57
81	I, 14th Regiment	43	23	15	5	3	20	53.20	43.26	48.23
82	A, 47th Regiment	35	29	10	10	9	6	45.20	50.86	48.03
83	Twenty-second Separ'te	81	63	19	24	20	18	49.38	46.17	47.78
84	Eleventh Separate	56	30	13	12	5	26	56.27	37.86	47.08
85	H, 12th Regiment	77	47	30	9	9	30	46.08	48.05	47.07
86	C, 74th Regiment	43	17	10	5	2	26	61.33	31.16	46.25
87	D, 74th Regiment	42	11	10	1	0	31	66.77	25.24	46 02
88	I, 47th Regiment	66	46	17	18	11	20	46.20	45.45	45.83
89	A, 32d Regiment	34	23	14	5	4	16	45.94	45.64	45.79
90	Fifth Separate	75	53	39	9	5	22	30.80	60.53	45.67
91	B, 71st Regiment	32	29	10	11	8	10	44.47	46.66	45.57
92	A, 22d Regiment	51	25	13	4	8	26	57.52	30.00	45.43
93	F, 32d Regiment	35	20	5	9	6	15	57.38	33.14	45.26
94	A, 14th Regiment	46	21	14	5	2	25	52.59	37.87	45.16
95	F, 12th Regiment	67	39	13	12	14	28	55.60	34.33	44.97
96	I, 8th Regiment	46	27	15	4	8	19	47.40	41.30	44.35

BY COMPANIES — *(Continued).*

Order of merit.	ORGANIZATION.	Inspection.	Practicing.	Marksmen.	CLASSES. First.	Second.	Third.	FIGURE OF MERIT. Volley and skirmish.	Individual.	General.
97	B, 8th Regiment	38	20	11	7	2	18	47.53	41.06	44.30
98	C, 32d Regiment	44	26	10	9	7	18	50.18	38.18	44.18
99	C, 8th Regiment	36	20	13	4	3	16	43.77	44.44	44.11
100	Twenty-first Separate	71	35	25	9	1	36	44.08	43.10	43.59
101	C, 71st Regiment	42	28	11	7	10	14	45.85	40.95	43.40
102	I, 12th Regiment	52	31	16	11	4	21	41.00	45.00	43.00
103	A, 71st Regiment	55	24	16	5	3	31	50.00	35.64	42.82
104	G, 47th Regiment	67	48	18	19	11	19	38.31	47.16	42.74
105	G, 74th Regiment	43	14	10	2	2	29	57.38	27.00	42.19
106	C, 65th Regiment	51	14	9	5	0	37	60.55	23.53	42.04
107	A, 74th Regiment	51	17	16	1	0	34	51.40	32.55	41.98
108	E, 12th Regiment	52	24	14	1	4	28	47.67	35.39	41.53
109	K, 69th Regiment	83	47	35	6	6	36	34.80	47.95	41.38
110	G, 12th Regiment	66	49	10	16	23	17	45.50	36.66	41.08
111	E, 8th Regiment	50	28	16	8	4	22	38.49	43.20	40.85
112	I, 9th Regiment	54	22	18	2	2	32	45.38	36.30	40.84
113	A, 12th Regiment	71	45	13	18	14	26	42.52	37.45	39.99
114	D, 9th Regiment	45	26	8	12	6	19	43.50	36.44	39.97
115	C, 12th Regiment	68	36	11	9	15	33	50.84	28.53	39.69
116	G, 32d Regiment	29	24	7	10	7	15	41.80	36.92	39.36
117	D, 22d Regiment	44	27	10	8	9	17	40.94	37.73	39.34
118	B, 9th Regiment	48	19	10	7	2	29	47.58	30.41	38.99
119	K, 11th Regiment	49	18	7	9	2	31	51.76	26.12	38.94
120	K, 12th Regiment	35	22	13	4	5	13	30.61	46.85	38.73
121	H, 22d Regiment	70	49	20	18	11	21	29.60	47.14	38.37
122	C, 22d Regiment	41	25	14	7	4	17	30.00	46.34	38.17
123	H, 8th Regiment	49	19	3	10	6	30	55.50	20.82	38.16
124	B, 14th Regiment	48	23	9	6	8	25	46.50	29.58	38.04
125	G, 11th Regiment	39	21	12	3	6	18	36.76	38.46	37.61
126	H, 32d Regiment	60	25	7	12	6	35	49.26	25.66	37.46
127	D, 32d Regiment	56	23	10	10	3	33	45.05	29.64	37.35
128	K, 32d Regiment	34	21	7	6	8	13	38.57	35.88	37.23
129	F, 9th Regiment	66	33	15	11	7	33	39.61	34.85	37.23
130	G, 9th Regiment	48	22	9	8	5	26	42.50	30.83	37.17
131	I, 32d Regiment	29	14	5	7	2	15	40.91	33.10	37.01
132	F, 14th Regiment	49	25	14	6	5	24	35.82	37.96	36.89
133	G, 69th Regiment	79	31	23	6	2	48	39.41	34.18	36.80
134	Thirty-sixth Separate	57	46	17	10	19	11	25.73	47.02	36.38
135	F, 69th Regiment	94	43	32	5	6	51	33.30	38.51	35.92
136	E, 22d Regiment	89	53	20	15	18	36	35.00	36.63	35.82
137	A, 11th Regiment	92	50	28	15	7	42	29.62	41.74	35.68
138	D, 14th Regiment	47	21	10	4	7	26	41.55	29.36	35.46
139	D, 69th Regiment	91	37	29	4	4	54	33.66	35.38	34.52
140	F, 11th Regiment	51	29	11	9	9	22	33.08	35 68	34.38
141	I, 69th Regiment	80	77	8	15	4	53	45.37	22.25	33.81
142	Twelfth Separate	98	34	14	14	6	64	43.41	24.08	33.75
143	G, 22d Regiment	43	21	7	12	2	22	33.07	33.95	33.51
144	K, 9th Regiment	52	25	7	9	9	27	38.87	27.31	33.09
145	D, 47th Regiment	55	31	14	6	11	24	30.04	36.00	33.02
146	E, 69th Regiment	101	36	11	16	9	65	43.49	22.17	32.83
147	B, 22d Regiment	82	48	22	11	15	34	29.95	35.53	32.74
148	G, 8th Regiment	44	23	6	8	9	21	35.81	28.64	32.23
149	I, 22d Regiment	51	23	10	11	2	28	30.87	33.33	32.10
150	A, 69th Regiment	74	41	19	8	14	33	27.56	35.95	31.76
151	K, 22d Regiment	45	19	7	8	4	26	35.38	28.00	31.69
152	B, 32d Regiment	46	25	5	12	8	21	32.75	30.00	31.38
153	K, 71st Regiment	64	33	7	16	10	31	33.60	29.06	31.33
154	F, 71st Regiment	49	19	4	9	6	30	41.00	21.63	31.32
155	C, 9th Regiment	51	24	5	13	6	29	34.52	27.44	30.98
156	D, 11th Regiment	67	38	10	13	15	29	29.83	31.05	30.44
157	A, 9th Regiment	56	27	7	11	9	29	32.74	27.50	30.12
158	G, 71st Regiment	48	17	8	3	6	31	37.14	22.92	30.03
159	B, 47th Regiment	41	19	3	8	8	21	36.40	22.93	29.67
160	B, 69th Regiment	80	49	8	18	23	31	29.73	29.25	29.49
161	I, 71st Regiment	73	73	14	5	4	50	34.50	24.38	29.44
162	D, 71st Regiment	89	36	10	10	16	53	35.12	21.57	28.35
163	H, 71st Regiment	69	34	9	11	14	35	29.65	26.66	28.16
164	H, 11th Regiment	46	27	6	7	14	19	25.60	28.26	26.93
165	D, 8th Regiment	76	24	14	8	2	52	28.12	25.26	26.69

BY COMPANIES — *(Concluded).*

Order of merit.	ORGANIZATION.	Inspection.	Practicing.	Marksmen.	CLASSES.			FIGURE OF MERIT.		
					First.	Second.	Third.	Volley and skirmish.	Individual.	General.
166	Thirty-first Separate ...	62	42	27	6	9	20	.....	52.26	26.13
167	B, 11th Regiment.....	67	49	4	10	35	18	22.99	25.37	24.18
168	E, 9th Regiment.....	47	19	7	5	7	28	22.44	24.25	23.35
169	Sixth Battery.....	65	43	17	19	7	22	.....	45.85	22.93
170	H, 69th Regiment.....	100	34	8	15	11	66	25.17	19.20	22.19
171	D, 10th Battalion	53	27	15	8	4	26	.....	38.86	19.43
172	I, 11th Regiment	55	24	3	5	16	31	20.43	16.73	18.58
173	Eighth Separate	59	26	13	10	3	33	.....	33.20	16.61
174	C, 14th Regiment.....	43	14	9	4	1	29	.....	26.98	13.49
175	H, 14th Regiment.....	47	15	8	5	2	32	.....	24.25	12.13
176	Fifteenth Separate.....	58	27	4	10	13	31	.....	21.72	10.86
177	G, 14th Regiment.....	54	13	8	3	2	41	.....	18.88	9.44
178	E, 14th Regiment.....	58	12	5	5	2	46	.....	14.48	7.24
179	F, 8th Regiment.....	55	9	2	4	3	46	.....	9.09	4.55
180	Thirteenth Separate ...	53	0	0	0	0	53	No	practice.	
181	Twenty-fourth Separate	63	0	0	0	0	63	No	practice.	
182	Twenty-fifth Separate..	31	0	0	0	0	31	No	practice.	
183	Twenty-eighth Separate	68	0	0	0	0	68	No	practice.	
184	Fortieth Separate.....	69	0	0	0	0	69	No	practice.	
185	Forty-first Separate	70	0	0	0	0	70	No	practice.	
186	Forty-third Separate ...	74	0	0	0	0	74	No	practice.	

I inclose a list of those who, retaining their membership in the service, have qualified for *thirteen* consecutive years; also, the names of those winning the silver or sharpshooter's bar.

MARKSMEN

Who have qualified for thirteen consecutive years.

Number.	RANK.	Name.	Organization.	200 yards.	500 yards.	Total.
1	Ord. Sergeant.	T. J. Dolan.....	Twelfth Regiment.....	24	24	48
2	Captain.....	Ezra DeForest.....	Twenty-third Regiment.....	23	23	46
3	Sergeant	A. B. Van Huesen	Twelfth Regiment.....	19	25	44
4	Ord. Sergeant.	C. E. Bryant.....	Twenty-third Regiment.	20	24	44
5	Lieut.-Colonel.	J. B. Frothingham....	A. A. G., Second Brigade.....	20	24	44
6	Private	G. F. Merchant.....	Seventh Regiment.....	20	24	44
7	Lieut.-Colonel.	F. C. McLewee	Assistant Inspector-General ..	19	24	43
8	Captain.....	W. L. Candee.....	Twenty-third Regiment.....	22	21	43
9	Lieutenant....	H. Nutt	Fourteenth Regiment.....	19	23	42
10	Captain.....	J. C. Abrams	Seventh Regiment.....	21	21	42
11	Major.....	Edward Duffy.....	Sixty-ninth Regiment.....	21	21	42
12	Private	N. D. Ward.....	Ninth Regiment	19	22	41
13	Sergeant	J. B. Holland	Seventh Regiment.....	20	20	40
14	Sergt.-Major ..	W. B. Coughtry	Seventh Regiment.....	19	18	37
15	Lieutenant....	J. I. Pruyn	Fourth Separate Company.....	19	17	36
16	Lieutenant....	G. W. Rand.....	Seventh Regiment.....	16	17	33
17	Captain.....	A. G. Brown.....	Forty-seventh Regiment.....	19	15	34
18	Colonel	E. A. Rockwood.	Supernumerary officer.....	18	15	33
19	Captain.....	Edw. Baker.....	Eighth Regiment	19	14	33
20	Lieutenant....	C. E. Kohlberger.....	Ninth Regiment	19	13	32
21	Private	A. L. Donegan	Ninth Regiment	13	18	31
22	Captain.....	R. Cobb	Fourth Separate Company.....	20	11	31
23	Captain.....	W. N. Murphy.....	Twelfth Regiment.....	20	10	30
24	Captain.....	W. J. Collins	Thirteenth Regiment	16	13	29
25	Lieutenant....	D. H. Teets	Seventy-first Regiment	17	11	28
26	Colonel	J. G. Story.....	Ordnance Department.....	18	9	27
27	Private	W. A. French.....	Seventh Regiment.....	5	21	26
28	Ord. Sergeant.	T. R. Murphy.....	Eighth Regiment.....	17	9	26
29	Colonel	G. D. Scott.....	Eighth Regiment.....	19	7	26
30	Private	M. P. Ross	Eighth Regiment.....	17	8	25

SHARPSHOOTERS.

Those who have made scores of forty-two and upwards.

Number.	RANK.	Name.	Organization.	200 yards.	500 yards.	Total.
1	Lieutenant	W. P. Pickett	Twenty-third Regiment	23	25	48
2	Colonel	P. P. Beals	Dept. Rifle Practice	23	25	48
3	Private	John F. Klein	Seventeenth Separate Comp'y.	23	25	48
4	Major	C. H. Gaus	I. R. P., Third Brigade	24	24	48
5	Private	S. C. Pirie	Twenty-third Regiment	24	24	48
6	Ord. Sergeant.	T. J. Dolan	Twelfth Regiment	24	24	48
7	Lieutenant	J. S. Shepard	Twenty-third Regiment	22	25	47
8	Lieutenant	G. F. Hamlin	Twenty-third Regiment	22	25	47
9	Sergeant	F. Stuart	Sixty-ninth Regiment	22	25	47
10	Private	D. H. Ogden	Twentieth Separate Company.	22	25	47
11	Sergeant	S. F. Fahnestock	Thirteenth Regiment	22	25	47
12	Private	J. McHenry	Fourteenth Regiment	23	24	47
13	Sergeant	F. A. Wells	Twenty-third Regiment	23	24	47
14	Corporal	W. J. Underwood	Seventh Regiment	23	24	47
15	Lieutenant	E. F. Young	Seventh Regiment	23	24	47
16	Sergeant	W. A. Stokes	Twenty-third Regiment	23	24	47
17	Private	G. W. Lotz	Thirteenth Regiment	24	23	47
18	Private	J. D. Burtis	Seventeenth Separate Comp'y.	24	23	47
19	Private	S. Schreiber	Tenth Battalion	21	25	46
20	Private	H. D. Hamilton	Twenty-third Regiment	21	25	46
21	Lieut.-Colonel.	W. E. Fitch	Tenth Battalion	22	24	46
22	Captain	W. H. Palmer	Seventh Regiment	22	24	46
23	Captain	N. B. Thurston	Twenty-second Regiment	22	24	46
24	Captain	W. Content	Twelfth Regiment	22	24	46
25	Captain	F. L. Holmes	Twenty-third Regiment	22	24	46
26	Captain	W. H. Greenland	Twenty-third Regiment	22	24	46
27	Lieutenant	J. R. Byrd	Twenty-second Regiment	22	24	46
28	Corporal	J. M. Garratt	Seventy-fourth Regiment	22	24	46
29	Private	George Ball	Twenty-third Regiment	22	24	46
30	Private	L. F. Pitcher	Sixth Battery	22	24	46
31	Private	L. J. Elliott	Twenty-third Regiment	22	24	46
32	Private	G. L. Hoffman	Seventh Regiment	22	24	46
33	Captain	Ezra De Forest	Twenty-third Regiment	23	23	46
34	Sergeant	W. A. Robinson	Twenty-third Regiment	23	23	46
35	Private	C. A. Jones	Seventh Regiment	23	23	46
36	Private	J. D. Foot	Seventh Regiment	23	23	46
37	Private	W. F. Cody	Thirteenth Regiment	23	23	46
38	Private	G. S. Scott, Jr.	Twenty-third Regiment	23	23	46
39	Private	C. W. Thom	Seventh Regiment	24	22	46
40	Private	R. M. Kalloch	Seventh Regiment	24	22	46
41	Ord. Sergeant.	James McNevin	Thirteenth Regiment	20	25	45
42	Sergt.-Major	A. D. Beeken	Twenty-third Regiment	20	25	45
43	Private	O. E. Dudley	Seventh Regiment	20	25	45
44	Major	H. C. Brown	Supernumerary	21	24	45
45	Captain	John Kerr	Sixty-ninth Regiment	21	24	45
46	Lieutenant	C. C. Wallace	Fourteenth Regiment	21	24	45
47	Ord. Sergeant.	James I. Miles	Tenth Battalion	21	24	45
48	Sergeant	J. S. Boyer	Thirty-ninth Separate Comp'y,	21	24	45
49	Private	T. Mahoney	Twelfth Regiment	21	24	45
50	Private	T. G. Austin	Thirteenth Regiment	21	24	45
51	Private	G. H. Frazer	Forty-seventh Regiment	21	24	45
52	Private	W. A. Bryant	Seventh Regiment	21	24	45
53	Private	J. P. M. Richards	Seventh Regiment	21	24	45
54	Private	G. P. Brower	Twenty-third Regiment	21	24	45
55	Lieutenant	P. Farrelly	Sixty-ninth Regiment	22	23	45
56	Lieutenant	S. W. Merritt	Seventh Regiment	22	23	45
57	Sergeant	O. W. Vatet	Twenty-second Regiment	22	23	45
58	Sergeant	C. L. Kelly	Sixty-ninth Regiment	22	23	45
59	Sergeant	R. McLean	Seventh Regiment	22	23	45
60	Sergeant	William Lawson	Twelfth Regiment	22	23	45
61	Sergeant	G. A. Lane	Thirteenth Regiment	22	23	45
62	Corporal	R. B. Simms	Eighth Regiment	22	23	45
63	Private	F. T. Cooke	Twenty-third Regiment	22	23	45
64	Private	H. W. Kraft	Thirteenth Regiment	22	23	45
65	Private	C. L. Levien	Twenty-second Regiment	22	23	45
66	Major	C. E. De La Vergne	Thirteenth Regiment	22	23	45
67	Captain	J. W. Hale	Eleventh Regiment	23	22	45
68	Corporal	M. B. Flynt	Thirteenth Regiment	23	22	45
69	Sergeant	H. T. Farrell	Twelfth Regiment	24	21	45
70	Private	H. G. Morris	Thirteenth Regiment	24	21	45

SHARPSHOOTERS — *(Continued).*

Number.	RANK.	Name.	Organization.	200 yards.	500 yards.	Total.
71	Sergeant	A. B. Van Heusen	Twelfth Regiment	19	25	44
72	Lieut.-Colonel.	J. B. Frothingham	A. A. G., Second Brigade	20	24	44
73	Major	G. L. Fox	I. R. P., Second Brigade	20	24	44
74	Captain	Wm. Franklin	Seventy-fourth Regiment	20	24	44
75	Captain	E. V. Denison	Tenth Battalion	20	24	44
76	Ord. Sergeant.	C. E. Bryant	Twenty-third Regiment	20	24	44
77	Quar.-mr. Sgt.	B. R. Spellman, Jr.	Tenth Battalion	20	24	44
78	Sergeant	M. E. Burnton	Twenty-second Regiment	20	24	44
79	Corporal	H. E. Hoehm	Twelfth Regiment	20	24	44
80	Private	F. F. Aldridge	Thirtieth Separate Company	20	24	44
81	Private	G. F. Merchant	Seventh Regiment	20	24	44
82	Private	W. L. Thompson	Seventh Regiment	20	24	44
83	Private	Alex. Stein	Seventh Regiment	20	24	44
84	Private	R. M. Dunn	Seventh Regiment	20	24	44
85	Private	R. L. Major	Seventh Regiment	20	24	44
86	Brigader-Gen.	C. F. Robbins	G. I. R. P., S. N. Y.	21	23	44
87	Lieutenant	A. C. Saunders	Twenty-third Regiment	21	23	44
88	Lieutenant	O. Oliver	Twenty-third Regiment	21	23	44
89	Corporal	E. V. Howard	Twenty-third Regiment	21	23	44
90	Private	T. Y. Hislop	Sixth Separate Company	21	23	44
91	Private	T. H. Barnard	Twenty-third Regiment	21	23	44
92	Private	E. W. Rudolph	Twenty-second Regiment	21	23	44
93	Private	F. S. Kennedy	Seventh Regiment	21	23	44
94	Private	P. Finnegan	Nineteenth Regiment	21	23	44
95	Colonel	W. M. Bloomer	Seventy-fourth Regiment	22	22	44
96	Ord. Sergeant.	E. W. Prince	Seventh Regiment	22	22	44
97	Sergeant	A. McDougall	Seventh Regiment	22	22	44
98	Sergeant	Thos. Kelly	Twelfth Regiment	22	22	44
99	Sergeant	J. M. McConnell	Ninth Regiment	22	22	44
100	Sergeant	G. E. Contable	Thirteenth Regiment	22	22	44
101	Sergeant	B. R. Meserole	Forty-seventh Regiment	22	22	44
102	Corporal	A. W. Trotter	Seventh Regiment	22	22	44
103	Private	J. G. Zimmermann, Jr.	Sixth Separate Company	22	22	44
104	Private	J. M. Tallman	Seventh Regiment	22	22	44
105	Major	C. H. Eagle	I. R. P., First Brigade	23	21	44
106	Sergeant	W. F. Germain	Eighth Regiment	23	21	44
107	Corporal	E. E. Van Hausen	Seventh Separate Company	23	21	44
108	Private	W. A. Dixon	Seventh Regiment	23	21	44
109	Private	J. Brewster	Forty-second Separate Co.	18	25	43
110	Lieut.-Colonel.	F. C. McLewee	A. I. G., S. N. Y.	19	24	43
111	Lieutenant	J. E. Van Ettan	Fourteenth Separate Company	19	24	43
112	Sergeant	H. P. Fowler	Twenty-third Regiment	19	24	43
113	Sergeant	T. M. Conedon	Twentieth Separate Company,	19	24	43
114	Corporal	A. H. Rennie	Tenth Battalion	19	24	43
115	Private	H. Hammond	Seventh Separate Company	19	24	43
116	Private	E. Lockley	Eighteenth Separate Company	19	24	43
117	Private	J. N. Munson	Seventh Regiment	19	24	43
118	Lieutenant	W. Desmond	Sixty-ninth Regiment	20	23	43
119	Lieutenant	McC. Butt	Twelfth Regiment	20	23	43
120	Sergeant	John Maxwell	Sixty-fifth Regiment	20	23	43
121	Sergeant	A. L. Ely	Seventh Regiment	20	23	43
122	Sergeant	T. A. Bentley	Seventh Regiment	20	23	43
123	Lieutenant	L. C. Quinn	Sixty-ninth Regiment	20	23	43
124	Private	W. G. Elliott	Forty-seventh Regiment	20	23	43
125	Private	C. H. Hoyt	Seventh Regiment	20	23	43
126	Private	A. G. Findlay, Jr.	Twenty-third Regiment	20	23	43
127	Private	H. Nichliwicz	Sixteenth Separate Company	20	23	43
128	Colonel	James H. Jones	Twelfth Regiment	21	22	43
129	Lieutenant	F. B. Streeter	Eighteenth Separate Company	21	22	43
130	Lieutenant	A. E. Schuman	Twelfth Regiment	21	22	43
131	Lieutenant	J. T. Hull	Twenty-third Regiment	21	22	43
132	Sergeant	H. B. Thompson	Seventh Regiment	21	22	43
133	Sergeant	F. Van Lennep	Seventh Regiment	21	22	43
134	Sergeant	C. H. Hitchcock	Twentieth Separate Company	21	22	43
135	Sergeant	E. L. Gager	Seventy-fourth Regiment	21	22	43
136	Corporal	H. Graff	Twenty-third Regiment	21	22	43
137	Private	P. Kenyon	Twenty-third Regiment	21	22	43
138	Private	H. E. Chapman	Seventh Regiment	21	22	43
139	Private	P. L. Klock	Seventh Regiment	21	22	43
140	Private	D. B. Darke	Seventh Regiment	21	22	43
141	Private	P. A. Ryan	Sixty-ninth Regiment	21	22	43
142	Private	A. Barier	Twentieth Separate Company	21	22	43

SHARPSHOOTERS — *(Continued)*.

Number.	RANK.	Name.	Organization.	200 yards.	500 yards.	Total.
143	Captain	W. L. Candee	Twenty-third Regiment	22	21	43
144	Lieutenant	W. H. Cochran	Thirteenth Regiment	22	21	43
145	Lieutenant	P. T. Perkins	Twenty-ninth Separate Comp'y	22	21	43
146	Lieutenant	T. J. McNeil	Seventh Separate Company	22	21	43
147	Sergeant	J. H. Cockburn	Twelfth Regiment	22	21	43
148	Sergeant	C. L. Kelly	Sixty-ninth Regiment	22	21	43
149	Sergeant	J. C. Hopson	Ninth Separate Company	22	21	43
150	Sergeant	T. A. Paterson	Ninth Separate Company	22	21	43
151	Sergeant	L. W. Finch	Ninth Separate Company	22	21	43
152	Corporal	J. E. Wildey	Eighteenth Separate Company,	22	21	43
153	Private	D. Bacon	Seventh Regiment	22	21	43
154	Private	G. A. Rogers	Seventy-fourth Regiment	22	21	43
155	Private	C. L. Pratt	Forty-second Separate Comp'y	22	21	43
156	Private	C. T. Broadman	Ninth Separate Company	22	21	43
157	Sergeant	Chris. Gresham	Tenth Battalion	23	20	43
158	Sergeant	F. C. White	Seventh Separate Company	23	20	43
159	Private	E. F. M. Wendelstadt	Twenty-third Regiment	23	20	43
160	Private	F. A. Ehret	Seventh Regiment	23	20	43
161	Private	D. W. Bugel	Twenty-third Separate Comp'y	23	20	43
162	Private	H. Palmer	Thirty-second Separate Comp.	23	20	43
163	Lieutenant	G. A. Williams	Twenty-third Regiment	18	24	42
164	Lieutenant	W. N. Barier	Twenty-second Regiment	18	24	42
165	Lieutenant	H. Nutt	Fourteenth Regiment	19	23	42
166	Lieutenant	W. T. Miles	Tenth Battalion	19	23	42
167	Lieutenant	A. C. Harwick	First Separate Company	19	23	42
168	Sergeant	W. L. Frost	Twelfth Regiment	19	23	42
169	Sergeant	Thomas Quinlan	Sixty-fifth Regiment	19	23	42
170	Corporal	W. C. Holmes	Twenty-third Regiment	19	23	42
171	Corporal	F. I. Perry	Twenty-third Regiment	19	23	42
172	Private	J. W. Cochran	Seventh Regiment	19	23	42
173	Private	F. R. Wiswell	Thirteenth Regiment	19	23	42
174	Private	I. E. Winslow	Twenty-third Regiment	19	23	42
175	Private	W. N. Griffith, Jr	Twenty-third Regiment	19	23	42
176	Private	J. E. Smith	Tenth Battalion	19	23	42
177	Private	M. E. Stewart	Twelfth Regiment	19	23	42
178	Captain	A. P. Delcombre	Seventy-first Regiment	20	22	42
179	Captain	W. F. Dent	Seventy-fourth Regiment	20	22	42
180	Captain	H. C. Aspinwall	Twelfth Regiment	20	22	42
181	Lieutenant	A. W. La Rose	Tenth Battalion	20	22	42
182	Sergeant	A. S. Gombers	Twenty-third Regiment	20	22	42
183	Sergeant	F. W. Singleton	Twenty-third Regiment	20	22	42
184	Sergeant	W. R. Zimmerman	Thirty-ninth Separate Comp'y	20	22	42
185	Corporal	G. E. Gunyan	Seventeenth Separate Comp'y.	20	22	42
186	Corporal	C. E. Knickerbocker	Sixth Separate Company	20	22	42
187	Corporal	J. W. Cleveland	Seventh Regiment	20	22	42
188	Corporal	W. H. Arnold	Twenty-seventh Separate Co.	20	22	42
189	Corporal	F. W. Messenger	Sixty-fifth Regiment	20	22	42
190	Corporal	F. P. De Vigne	Thirteenth Regiment	20	22	42
191	Private	A. Findlay	Twenty-third Regiment	20	22	42
192	Private	G. L. Stebbins	Seventh Regiment	20	22	42
193	Private	F. W. Perkins	Seventh Regiment	20	22	42
194	Private	James Henry	Seventh Separate Company	20	22	42
195	Private	H. P. Hildreth	Twenty-third Regiment	20	22	42
196	Private	H. J. Mizner	First Separate Company	20	22	42
197	Private	C. E. Wright	First Separate Company	20	22	42
198	Major	Edward Duffy	Sixty-ninth Regiment	21	21	42
199	Captain	E. Root	Twenty-sixth Separate Comp'y	21	21	42
200	Captain	J. C. Abrams	Seventh Regiment	21	21	42
201	Lieutenant	T. C. Collin	Seventh Separate Co.	21	21	42
202	Sergeant	E. L. Everett	Sixth Separate Company	21	21	42
203	Sergeant	D. E. McLean	Thirty-third Separate Comp'y.	21	21	42
204	Sergeant	W. F. Smith	Sixty-ninth Regiment	21	21	42
205	Corporal	J. S. B. Bogardus	Twenty-third Separate Comp'y	21	21	42
206	Private	L. Bondrias, Jr	Seventh Separate Company	21	21	42
207	Private	J. L. Jennings	Twelfth Regiment	21	21	42
208	Private	M. V. Rohan	Nineteenth Regiment	21	21	42
209	Private	W. A. Hockemeyer	Twenty-third Regiment	21	21	42
210	Private	C. C. Brown	Seventh Regiment	21	21	42
211	Private	E. R. Richards	Seventh Regiment	21	21	42
212	Private	H. H. Spies	Seventh Regiment	21	21	42
213	Captain	H. P. Stacpole	Tenth Battalion	22	20	42
214	Captain	A. W. Conover	Seventh Regiment	22	20	42
215	Captain	J. S. Garratt	Eighteenth Separate Company	22	20	42

SHARPSHOOTERS. — *(Concluded).*

Number.	RANK.	Name.	Organization.	200 yards.	500 yards.	Total.
216	Captain	L. F. Barry	Seventy-first Regiment	22	20	42
217	Lieutenant	G. J. Green	Tenth Battalion	22	20	42
218	Lieutenant	P. Carroll	Sixty-ninth Regiment	22	20	42
219	Sergeant	T. C. Rose	Twelfth Regiment	22	20	42
220	Sergeant	G. C. Broome	Thirteenth Regiment	22	20	42
221	Sergeant	F. J. Higgins	Ninth Regiment	22	20	42
222	Sergeant	C. S. Winnie	Tenth Battalion	22	20	42
223	Corporal	J. F. Stier	Twenty-third Regiment	22	20	42
224	Private	Val Werner	Thirteenth Regiment	22	20	42
225	Private	W. H. Townsend	Twenty-third Regiment	22	20	42
226	Private	W. E. De Barthe	Tenth Battalion	22	20	42
227	Private	R. C. Payne	Twenty-third Separate Comp'y	22	20	42
228	Sergeant	James Roach	Tenth Battalion	23	19	42
229	Sergeant	F. Magee	Sixty-ninth Regiment	23	19	42
230	Corporal	R. E. Emblidge	Sixty-fifth Regiment	23	19	42
231	Private	J. H. La Croix	Fourteenth Regiment	23	19	42

During the fall meeting of the National Rifle Association at Creedmoor, September 12 to 17, 1887.

MATCHES

For the various prizes offered by the State were shot as usual also at Rensselaerwyck and Bay View as follows:

State Match.

Prize, a bronze group, representing an "Archer," "Scholar" and "Guard." Value, $350. Competed for by teams of the Seventh, Eighth, Thirteenth and Twenty-third Regiments, and won by the Twenty-third Regiment team. Score at:

REGIMENT.	200 yards.	500 yards.	Total
Twenty-third Regiment	253	271	524
Seventh Regiment	241	259	500
Thirteenth Regiment	230	257	487
Eighth Regiment	229	194	423

The winning score never before equaled. The

First Brigade Match.

Prize, bronze figure, "The Fencer." Value, $100. Won by team of Seventh Regiment, with score of 200 yards, 243; 500 yards, 261; total, 504. Second, Eighth Regiment, 200 yards, 216; 500 yards, 176; total, 392. The

Second Brigade Match.

Prize, bronze figure, "Marley Horse." Value, $100. Was won by team from the Twenty-third Regiment with a score of 200 yards, 248;

500 yards, 265; total, 513. Second, Thirteenth Regiment, 200 yards, 245; 500 yards, 256; total, 501. The

Third Brigade Match.

Prize, bronze figure, "Archer." Value, $100. Was held at Rensselaerwyck, and won by team from the Tenth Battalion, with a score of (teams of six men):

TEAM.	200 yards.	500 yards.	Total.
Tenth Battalion	117	119	236
Twentieth Separate Company	113	118	231
Sixth Separate Company	112	110	222
Eighteenth Separate Company	83	101	184

The Fourth Brigade Match.

Prize, value $100; not yet selected. Held at Bay View, and won by team from Thirtieth Separate Company, with score of (teams of six men):

TEAM.	200 yards.	500 yards.	Total.
Thirtieth Separate Company	111	113	224
Forty-second Separate Co. (first team)	108	98	206
B, Seventy-fourth Regiment	97	92	189
Forty-second Separate Co. (second team)	99	80	179
F, Seventy-fourth Regiment	96	81	177
First Separate Company	89	77	166
F, Sixty-fifth Regiment	91	65	156

The State team again chosen from the only available men on the range competed with Massachusetts and Pennsylvania teams, and were beaten by a technicality, one of the members having shot on the back position — against the rules — the scores were as follows for the

Interstate Trophy:

TEAM.	200 yards.	500 yards.	Total.
Massachusetts	503	511	1,014
Pennsylvania	500	495	995
New York	510	515	.....

=1,025 — 33 points deducted for wrong position, 992.

In the

Hilton Trophy

the scores were as follows:

TEAM.	200 yards.	500 yards.	600 yards.	Total.
Massachusetts	362	382	352	1,096
Division of Atlantic, U. S. A.	361	380	352	1,093
New York	357	372	359	1,088
Pennsylvania	351	344	329	1,024

The following companies stand highest in their brigades in general figure of merit:

First Brigade, Company B, Seventh Regiment, G. F. M. 91.49
Second Brigade, Company I, Twenty-third Regiment, G. F. M., 88.38
Third Brigade, Eighteenth Separate Company, G. F. M. 89.51
Fourth Brigade, Second Separate Company, G. F. M. 81.50

and are each entitled to a prize valued at fifty (50) dollars.

There are other companies throughout the State of whom honorable mention should be made — among them the Third, Seventh, Twentieth, Twenty-sixth, Thirty-second, Thirty-fourth, Thirty-ninth and Forty-second Separate Companies, and Companies F, I and K, Seventh Regiment, and Company K, Thirteenth Regiment, all these show a large percentage of members practicing — on the other hand the Thirteenth, Twenty-fifth, Twenty-eighth, Fortieth, and Forty-first Separate Companies have not practiced at all, and the Twenty-eighth Separate Company have had only *one* (1) practice in the last five years — a state of affairs showing but little credit to the commanding officer.

RANGES.

Are generally in good condition, new ones having been provided principally at State expense at, Auburn, Niagara, Walton, Olean, and repairs at Bay View (Buffalo) and Schenectady. For specific information regarding all I would respectfully refer you to letter accompanying this and marked "A."

RECOMMENDATIONS.

An allowance of some specified amount for armory practice as mentioned last year would be a great help to deserving organizations ample allowance of field ammunition and where practicable transportation is a great incentive. Many men can spare time which would be taken up in practice if transportation and ammunition be furnished — but can not spare the means needed to provide same.

As you know efforts were made during the year to improve our arm, but it was not deemed wise to carry out the plans — I can only repeat my words of last year in regard to it.

The gradual, and this year greater increase in interest is very gratifying and a careful review will, I think, satisfy all that we are advancing — not standing still.

I am sir, very respectfully, yours.

CHARLES F. ROBBINS,

Brigadier-General and General-Inspector Rifle Practice, S. N. Y.

STATE OF NEW YORK:

DEPARTMENT OF RIFLE PRACTICE, 8 COENTIES SLIP,
NEW YORK, *December* 31, 1887.

The Adjutant-General, State of New York:

SIR.— Below please find data relating to various ranges used by the State troops in rifle practice, of which the largest,

CREEDMOOR,

has been used by 5,000 individual members of the National Guard, under orders; and if those practicing during the so-called free practice be added, over 6,500 men have practiced here, at an expense to the State of about seventy cents per man, or, if transportation be added, one dollar and twenty cents per man. All infantry of the First and Second Brigades and the Fourth and Eleventh Separate Companies use this for their rifle practice — about 7,900 men in aggregate.

The range is in good condition, and the east pit having been renewed this year is in good shape; the line fences and fence on top of east butt, as also all the west butt, are in bad shape. During the past year complaints have been made of bullets dropping on contiguous grounds, and under an arbitration the National Rifle Association were obliged to pay $500 to one party as damage arising from non-ability to use or till the land, besides leasing other portions at an expense of $350. Some arrangement will have to be made to acquire the rights to this land, or the practice will be greatly hindered.

First Separate Company

Practices on new range built in 1886, at Penn Yan. In good condition.

Second Separate Company

Have abandoned their range on the fair grounds at Auburn and secured a new one on the line of the railroad; quite accessible. It was furnished by the State with new targets late in the fall of this year.

Third Separate Company.

Range at Oneonta in fair condition.

Fourth Separate Company,

Yonkers, practices at Creedmoor.

Fifth Separate Company.

Range at Newburgh in good shape; was new in 1886, and is well looked after.

Sixth Separate Company,

Of Troy, practices at Rensselaerwyck. (See Tenth Battalion.)

Seventh Separate Company,

Of Cohoes, practices at Rensselaerwyck. (See Tenth Battalion.)

Eighth Separate Company

Has range near Rochester in general good condition. A little more care by the custodian would be beneficial.

Ninth Separate Company

Have range at Whitehall in fair condition; but little used this year.

Tenth Separate Company,

Of Newburgh. (See Fifth Separate Company.)

Eleventh Separate Company,

Of Mt. Vernon, practices at Creedmoor.

Twelfth Separate Company,

Of Troy, practices at Rensselaerwyck. (See Tenth Battalion.)

Thirteenth Separate Company,

Of Jamestown; lately reorganized. Nothing been done in way of practice.

Fourteenth Separate Company

Have range about three miles from Kingston, in good shape.

Fifteenth Separate Company.

Range near Poughkeepsie, was put in order—rebuilt in 1886, and is kept in first class order by the commandant of the Nineteenth Separate Company in whose charge it is.

Sixteenth Separate Company,

Of Catskill, has no range, but uses that at Kingston. As in my last report of 1886, I would say a little more energy on part of C. O., Sixteenth Separate Company could procure a suitable location for range near by.

Seventeenth Separate Company,

Of Flushing, practices at Creedmoor.

Eighteenth Separate Company,

Range near Glens Falls; in general good condition.

Nineteenth Separate Company,

Of Poughkeepsie. (See Fifteenth Separate Company.)

Twentieth Separate Company

Has range near Binghamton. Is well located, but ought to be rebuilt and have two sets targets.

Twenty-first Separate Company,

Of Troy, practices at Rensselaerwyck. (See Tenth Battalion.)

Twenty-second Separate Company,

Of Saratoga, should have new range and new targets. Range badly located; pit decayed; targets obsolete and worn out.

Twenty-third Separate Company

Of Hudson. (Remarks on Sixteenth Separate Company will also apply to this.)

Twenty-fourth Separate Company

Of Middletown—a new company.

Twenty-fifth Separate Company,

Of Canandaigua, did not practice. Range needs looking after.

Twenty-sixth Separate Company,

Of Elmira, has use with Thirtieth Separate Company of the range of the Southern Tier Rifle Association, whose range, under good control, is kept in order.

Twenty-seventh Separate Company

Has range at Malone, in poor shape. Have had some talk about moving to near position.

Twenty-eighth Separate Company,

Of Utica, no range. No effort to obtain one; no spirit here. Have practiced once only in six years, and then when in camp.

Twenty-ninth Separate Company,

At Oswego, have used with the Thirty-eighth separate Company the grounds of the United States. In fair order considering location, nearness to armory. Should be more used for the benefit of these companies.

Thirtieth Separate Company,

Of Elmira. (See Twenty-sixth Separate Company.)

Thirty-first Separate Company,

Of Mohawk — range merely a temporary one and poor — if effort is made to get a good location should have help.

Thirty-second Separate Company,

Of Hoosick Falls, practice at Rensselaerwyck (See Tenth Battalion); effort should be made to get range nearer home.

Thirty-third Separate Company,

Of Walton, have good range and new targets in good shape.

Thirty-fourth Separate Company,

Of Geneva, nothing new of this range, is not as good as should be.

Thirty-fifth Separate Company,

Of Ogdensburgh, uses a range built by a rifle club; the present arrangement of targets (sliding) is bad; should, if possible, change location, and have some State help.

Thirty-sixth Separate Company,

has good range near Schenectady; had new targets this year, are in good shape.

Thirty-seventh Separate Company,

Of Schenectady. (See Thirty-sixth Separate Company.)

Thirty-eighth Separate Company,

Of Oswego. (See Twenty-ninth Separate Company.)

Thirty-ninth Separate Company,

Of Watertown; can only repeat what I said last year.

Fortieth Separate Company,

At Syracuse, are dead in rifle practice; no range, no effort to obtain any; might be armed with swords, do not know how to use a rifle.

Forty-first Separate Company,

Of Syracuse. (See Fortieth Separate Company, above.)

Forty-second Separate Company,

Of Niagara Falls have located new range and a good one, and have been supplied by the State with targets.

Forty-third Separate Company,

Of Olean, new company, have located good range, State supplied new targets.

Forty-fourth Separate Company,

Of Utica, new company.

Tenth Battalion,

At Albany, use range at Rensselaerwyck, good range in fair order, will need some new targets the coming year.

Sixty-fifth and Seventy-fourth Regiments,

Of Buffalo, use range at Bay View, in fair condition only.

Seven thousand three hundred and fourteen men have practiced under orders on the various ranges throughout the State, and in most organizations there is an effort to show appreciation of State's help towards perfection in use of arm. The following table will show amounts allowed in 1887, for various ranges, viz.:

Creedmoor	$4,000
Rensselaerwyck	650
Bay View	680
Penn Yan	200
Elmira	100
Poughkeepsie	100
Auburn	81
Watertown	50
Oneonta	50
Newburgh	50
Binghamton	50

Glens Falls	$50
Kingston	50
Rochester	50
Niagara Falls	50
Schenectady	30
Oswego	25

I am sir, very respectfully, yours.

CHARLES F. ROBBINS,

Brigadier-General and General-Inspector Rifle Practice, S. N. Y.

STATE FIGURE OF MERIT.

STATE OF NEW YORK:

DEPARTMENT OF RIFLE PRACTICE,
NEW YORK, *December* 31, 1887.

The following is published for the information of the National Guard, as the figure of merit or comparative efficiency in rifle practice displayed by the various organizations during the year 1887:

	1887.	1886.	1885.
Firing in ranks	53.70	50.09	49.49
Individual practice	50.10	43.88	45.00
General figure	51.90	46.99	47.25
Marksmen (number)	47.28	36.46	34.21

BY BRIGADES.

Order of merit.	ORGANIZATION.	Inspection.	Practicing.	Marksmen.	CLASSES. First.	Second.	Third.	FIGURE OF MERIT. Volley and skirmish.	Individual.	General.
1	Third	2,262	1,538	1,037	335	166	724	57.67	56.19	56.93
2	Fourth	1,711	857	639	165	53	854	64.87	43.75	54.31
3	Second	2,579	1,745	1,145	382	218	834	51.98	54.98	53.48
4	First	5,159	3,152	1,887	701	564	2,007	49.04	46.91	47.98

BY REGIMENTS.

1	Seventh	1,014	977	864	83	30	37	66.68	90.71	78.70
2	Twenty-third	664	549	456	74	19	115	55.53	75.93	65.73
3	Thirteenth	512	387	296	59	32	125	58.18	65.97	62.08
4	Seventy-fourth	338	143	122	15	6	195	68.28	39.11	53.70
5	Tenth (Battalion)	246	150	106	34	10	96	52.47	52.19	52.33
6	Sixty-fifth	429	220	158	49	13	209	58.99	44.29	51.64
7	Forty-seventh	438	314	131	107	76	124	46.09	48.04	47.07
8	Twenty-second	572	331	150	105	76	241	53.68	39.90	46.79
9	Twelfth	654	404	197	110	97	250	47.26	43.18	45.22
10	Thirty-second	399	217	82	83	52	182	44.30	35.64	39.97
11	Fourteenth	502	215	122	56	37	287	45.54	32.47	39.01
12	Eighth	413	185	92	54	39	228	43.45	32.01	37.73
13	Ninth	539	272	124	91	57	267	39.80	35.25	37.53
14	Sixty-ninth	888	422	245	95	82	466	34.19	35.86	35.03
15	Seventy-first	546	255	99	78	78	291	38.07	29.56	33.82
16	Eleventh	521	296	106	85	105	225	31.20	34.16	32.68

BY COMPANIES.

Order of merit.	ORGANIZATION.	Inspection.	Practicing.	Marksmen.	CLASSES. First.	Second.	Third.	FIGURE OF MERIT. Volley and skirmish.	Individual.	General.
1	B, 7th Regiment	101	117	110	5	2	.....	70.71	112.27	91.49
2	Eighteenth Separate	45	52	49	2	1	.....	67.02	112.00	89.51
3	F, 7th Regiment	101	105	102	3	....	.....	76.18	102.77	89.48
4	I, 23d Regiment	69	75	75	....	....	.....	68.06	108.70	88.38
5	K, 7th Regiment	101	104	91	11	2	.....	70.81	97.03	83.92
6	I, 7th Regiment	101	105	92	11	2	.....	68.53	98.02	83.28
7	Second Separate	77	75	71	3	1	2	68.20	94.80	81.50
8	Seventeenth Separate	52	53	48	3	2	0	65.03	96.54	80.79
9	C, 7th Regiment	101	90	83	5	2	11	74.57	85.54	80.06
10	H, 7th Regiment	101	93	81	8	4	8	70.82	85.74	78.28
11	Seventh Separate	67	68	58	6	4	.....	58.88	93.13	76.01
12	K, 13th Regiment	48	44	42	1	1	4	62.80	89.16	75.98
13	I, 13th Regiment	41	40	39	....	1	1	56.11	95.61	75.86
14	Thirty-ninth Separate	87	67	61	5	1	20	77.44	73.80	75.62
15	Sixth Separate	102	87	80	7	....	15	62.84	82.55	72.69
16	Twenty-sixth Separate	94	80	61	14	5	14	70.30	74.90	72.60
17	D, 23d Regiment	59	51	37	12	2	5	65.38	79.64	72.51
18	A, 7th Regiment	101	94	76	14	4	7	60.13	84.35	72.24
19	F, 74th Regiment	43	30	26	2	2	13	80.08	64.19	72.14
20	Thirtieth Separate	70	62	48	11	3	8	64.49	78.86	71.68
21	Ninth Separate	34	26	24	2	....	8	68.25	74.12	71.19
22	E, 7th Regiment	94	73	67	4	2	21	68.11	74.25	71.18
23	Twentieth Separate	82	79	41	34	4	3	65.26	75.85	70.56
24	G, 7th Regiment	101	97	78	14	5	4	54.27	86.53	70.40
25	Thirty-third Separate	67	63	44	12	7	4	61.87	78.51	70.19
26	Forty-second Separate	100	94	55	30	9	6	63.97	74.80	69.38
27	Thirty-fourth Separate	55	49	37	6	6	6	61.56	76.00	68.78
28	B, 23d Regiment	60	49	42	6	1	11	58.69	76.33	67.51
29	A, 23d Regiment	82	72	60	10	2	10	53.83	80.98	67.41
30	D, 7th Regiment	93	82	69	6	7	11	54.84	79.57	67.20
31	D, 13th Regiment	42	37	29	3	5	5	58.54	75.71	67.13
32	F, 23d Regiment	67	59	48	8	3	8	53.00	79.70	66.35
33	Twenty-seventh Sep'ate	62	58	31	21	6	4	59.42	72.26	65.84
34	Third Separate	88	84	48	24	12	4	57.38	73.63	65.51
35	C, 23d Regiment	58	53	46	4	3	5	45.87	84.48	65.18
36	Fourth Separate	62	52	31	15	6	10	61.00	66.45	63.73
37	Fourteenth Separate	72	54	42	7	5	18	61.71	65.55	63.63
38	G, 13th Regiment	72	53	44	7	2	19	59.72	67.50	63.61
39	F, 22d Regiment	36	28	19	7	2	8	60.46	65.55	63.01
40	Twenty-third Separate	64	35	33	1	1	29	71.29	52.81	62.05
41	H, 23d Regiment	61	49	36	12	1	12	52.61	71.05	61.83
42	Twenty-ninth Separate	62	42	21	17	4	20	71.53	51.61	61.57
43	B, 13th Regiment	45	36	25	9	2	9	54.25	68.44	61.35
44	F, 65th Regiment	49	36	28	6	2	13	57.29	65.31	61.30
45	Thirty-second Separate	75	66	62	2	2	9	37.61	84.80	61.21
46	F, 47th Regiment	55	47	27	12	8	8	57.00	65.09	61.05
47	B, 74th Regiment	52	25	23	2	....	27	75.20	46.54	60.87
48	A, 13th Regiment	48	33	23	7	3	15	62.38	57.92	60.15
49	First Separate	52	31	24	6	1	21	65.21	53.46	59.34
50	B, 10th Battalion	58	41	36	4	1	17	50.21	66.55	58.38
51	C, 13th Regiment	55	43	23	11	9	12	56.84	57.09	56.97
52	A, 10th Battalion	65	47	29	14	4	18	54.55	58.77	56.66
53	Nineteenth Separate	100	67	49	11	7	33	56.24	57.00	56.62
54	E, 23d Regiment	57	42	32	7	3	15	47.80	64.56	56.18
55	K, 47th Regiment	62	50	25	17	8	12	51.37	59.35	55.86
56	C, 69th Regiment	87	66	63	1	2	21	38.10	73.56	55.78
57	B, 12th Regiment	51	35	21	11	3	16	55.82	55.30	55.56
58	A, 65th Regiment	44	19	17	2	....	25	69.66	41.36	55.51
59	Thirty-eighth Separate	66	27	23	3	1	39	72.87	37.88	55.38
60	P, 65th Regiment	60	37	29	6	2	23	55.55	55.00	55.28
61	H, 13th Regiment	48	27	18	7	2	21	62.26	47.08	54.67
62	G, 23d Regiment	64	37	30	7	....	27	55.14	53.44	54.29
63	K, 23d Regiment	73	46	34	8	4	27	54.30	54.25	54.28
64	F, 13th Regiment	47	32	20	9	3	15	51.62	55.32	53.47
65	G, 65th Regiment	48	16	15	1	....	32	74.00	32.50	53.25
66	Tenth Separate	52	33	20	8	5	19	56.82	49.61	53.22
67	Thirty-seventh Separ'te	57	43	50	7	6	14	43.60	62.10	52.85
68	C, 11th Regiment	39	29	18	10	1	10	43.16	62.05	52.61
69	Sixteenth Separate	61	32	19	11	2	29	62.15	42.62	52.39

By COMPANIES — *(Continued).*

Order of merit.	ORGANIZATION.	Inspection.	Practicing.	Marksmen.	CLASSES. First.	Second.	Third.	FIGURE OF MERIT. Volley and skirmish.	Individual.	General.
70	Thirty-fifth Separate ...	73	48	33	13	2	25	47.08	56 44	51.76
71	K, 14th Regiment.....	48	35	21	10	4	13	45.49	57.91	51.70
72	I, 65th Regiment	52	34	13	16	5	18	56.92	45.38	51.65
73	D, 65th Regiment.....	54	28	23	1	4	26	57.30	45.19	51.25
74	H, 9th Regiment.....	53	39	22	13	4	14	44.51	57.73	51.12
75	D, 12th Regiment.....	97	62	41	14	7	35	49.08	52.37	50.73
76	E, 13th Regiment.....	50	28	19	5	4	22	54.21	45.60	49.91
77	H, 65th Regiment.....	54	26	15	11	....	28	59.51	40.00	49.76
78	E, 74th Regiment.....	47	15	14	1	....	32	67.71	31.06	49.39
79	E, 47th Regiment.....	38	27	5	13	9	11	59.33	38.42	48.88
80	C, 10th Battalion	56	28	19	8	1	28	54.28	42.86	48.57
81	I, 14th Regiment	43	23	15	5	3	20	53.20	43.26	48.23
82	A, 47th Regiment.....	35	29	10	10	9	6	45.20	50.86	48.03
83	Twenty-second Separ'te	81	63	19	24	20	18	49.38	46.17	47.78
84	Eleventh Separate	56	30	13	12	5	26	56.27	37.89	47.08
85	H, 12th Regiment.....	77	47	30	9	8	30	46.08	48.05	47.07
86	C, 74th Regiment.....	43	17	10	5	2	26	61.33	31.16	46.25
87	D, 74th Regiment.....	42	11	10	1	....	31	66.77	25.24	46.02
88	I, 47th Regiment	66	46	17	18	11	20	46.20	45.45	45.83
89	A, 32d Regiment.....	39	23	14	5	4	16	45.94	45.64	45.79
90	Fifth Separate.....	75	53	39	9	5	22	30.80	60.53	45.67
91	B, 71st Regiment.....	32	29	10	11	8	10	44.47	46.66	45.57
92	A, 22d Regiment.....	51	25	13	4	8	26	57.52	33.00	45.43
93	F, 32d Regiment.....	35	20	5	9	6	15	57.38	33.14	45.26
94	A, 14th Regiment.....	46	21	14	5	2	25	52.50	37.82	45.16
95	F, 12th Regiment.....	67	39	13	12	14	28	55.60	34.33	44.97
96	I, 8th Regiment	46	27	15	4	8	19	47.40	41.30	44.35
97	B, 8th Regiment.....	38	20	11	7	2	18	47.53	41.06	44.30
98	C, 32d Regiment.....	44	26	10	9	7	18	50.18	38.18	44.18
99	C, 8th Regiment.....	36	20	13	4	3	16	43.77	44.44	44.11
100	Twenty-first Separate..	71	35	25	9	1	36	44.08	43.10	43.59
101	C, 71st Regiment	42	28	11	7	10	14	45.95	40.95	43.40
102	I, 12th Regiment	52	31	16	11	4	21	41.00	45.00	43.00
103	A, 71st Regiment	55	24	16	5	3	31	50.00	35.64	42.82
104	G, 47th Regiment.....	67	48	18	19	11	19	38.31	47.16	42.74
105	G, 74th Regiment.....	43	14	10	2	2	29	57.38	27.00	42.19
106	C, 65th Regiment.....	51	14	9	5	....	37	60.55	23.53	42.04
107	A, 74th Regiment.....	51	17	16	1	....	34	51.46	32.55	41.98
108	E, 12th Regiment...	52	24	14	6	4	28	47.67	35.39	41.53
109	K, 69th Regiment.....	83	47	35	6	6	36	34.80	47.95	41.38
110	G, 12th Regiment.....	66	49	10	16	23	17	45.50	36.66	41.08
111	E, 8th Regiment.....	50	23	16	8	4	22	38.49	43.20	40.85
112	I, 9th Regiment	54	22	18	2	2	32	45.38	36.30	40.84
113	A, 12th Regiment.....	71	45	13	18	14	26	42.52	37.45	39.99
114	D, 9th Regiment	45	26	8	12	6	19	43.50	36.44	39.97
115	C, 12th Regiment.....	68	35	11	9	15	33	50.84	28.53	39.69
116	G, 32d Regiment	39	24	7	10	7	15	41.80	36.92	39.36
117	D, 22d Regiment	44	27	10	8	9	17	40.94	37.73	39.34
118	B, 9th Regiment.....	48	19	10	7	2	29	47.58	30.41	38.99
119	K, 11th Regiment.....	49	18	7	9	2	31	51.76	26.12	38.94
120	K, 12th Regiment.....	35	22	13	4	5	13	30.61	46.85	38.73
121	H, 22d Regiment	70	49	20	18	11	21	29.60	47.14	38.37
122	C, 22d Regiment.....	41	25	14	7	4	16	30.00	46.34	38.17
123	H, 8th Regiment	49	19	3	10	6	30	55.50	20.82	38.16
124	B, 14th Regiment.....	48	23	9	6	8	25	46.50	29.58	38.04
125	G, 11th Regiment.....	39	21	12	3	6	18	36.76	38.46	37.61
126	H, 32d Regiment	60	25	7	12	6	35	49.26	25.66	37.46
127	D, 32d Regiment	56	23	10	10	3	33	45.05	29.64	37.35
128	K, 32d Regiment	34	21	7	6	8	13	38.57	35.88	37.23
129	F, 9th Regiment.....	66	33	15	11	7	33	39.61	34.85	37.23
130	G, 9th Regiment.....	48	22	9	8	5	26	43.50	30.83	37.17
131	I, 32d Regiment	29	14	5	7	2	15	40.91	33.10	37.01
132	F, 14th Regiment.....	49	25	14	6	5	24	35.82	37.96	36.89
133	G, 69th Regiment.....	79	31	23	6	2	48	39.41	34.18	36.80
134	Thirty-sixth Separate..	57	46	17	10	19	11	25.73	47.02	36.38
135	F, 69th Regiment.....	94	43	32	5	6	51	33.30	38.51	35.92
136	E, 22d Regiment.....	89	53	20	15	18	36	35.00	36.63	35.82
137	A, 11th Regiment.....	92	50	28	15	7	42	29.62	41.74	35.68
138	D, 14th Regiment.....	47	21	10	4	7	26	41.55	29.36	35.46

BY COMPANIES — *(Concluded).*

Order of merit.	ORGANIZATION.	Inspection.	Practicing.	Marksmen.	CLASSES. First.	Second.	Third.	FIGURE OF MERIT. Volley and skirmish.	Individual.	General.
139	D, 69th Regiment	91	37	29	4	4	54	33.66	35.38	34.52
140	F, 11th Regiment	51	29	11	9	9	22	33.08	35.68	34.38
141	I, 69th Regiment	80	77	8	15	4	53	45.37	22.25	33.81
142	Twelfth Separate	98	34	14	14	6	64	43.41	24.08	33.75
143	G, 22d Regiment	43	21	7	12	2	22	33.07	33.95	33.51
144	K, 9th Regiment	52	25	7	9	9	27	38.87	37.31	33.09
145	D, 47th Regiment	55	31	14	6	11	24	30.04	36.00	33.02
146	E, 69th Regiment	101	36	11	16	9	65	43.49	22.17	32.83
147	B, 22d Regiment	82	48	22	11	15	34	29.95	35.53	32.74
148	G, 8th Regiment	44	23	6	8	9	21	35.81	28.64	32.23
149	I, 22d Regiment	51	23	10	11	2	28	30.87	33.33	32.10
150	A, 69th Regiment	74	41	19	8	14	33	27.56	35.95	31.76
151	K, 22d Regiment	45	19	7	8	4	26	35.38	28.00	31.69
152	B, 32d Regiment	46	25	5	12	8	21	32.75	30.00	31.38
153	K, 71st Regiment	64	33	7	16	10	31	33.60	29.06	31.33
154	F, 71st Regiment	49	19	4	9	6	30	41.00	21.63	31.32
155	C, 9th Regiment	51	24	5	13	6	27	34.52	27.44	30.98
156	D, 11th Regiment	67	38	10	13	15	29	29.83	31.05	30.44
157	A, 9th Regiment	56	27	7	11	9	29	32.74	27.50	30.12
158	G, 71st Regiment	48	17	8	3	6	31	37.14	22.92	30.03
159	B, 47th Regiment	41	19	3	8	8	22	36.40	22.93	29.67
160	B, 69th Regiment	80	49	8	18	23	31	29.73	29.25	29.49
161	I, 71st Regiment	73	23	14	5	4	50	34.50	24.38	29.44
162	D, 71st Regiment	89	36	10	10	16	53	35.12	21.57	28.35
163	H, 71st Regiment	69	34	9	11	14	35	29.65	26.66	28.16
164	H, 11th Regiment	46	27	6	7	14	19	25.60	28.26	26.93
165	D, 8th Regiment	76	24	14	8	2	52	28.12	25.26	26.69
166	Thirty-first Separate	62	42	27	6	9	20	.....	52.26	26.13
167	B, 11th Regiment	67	49	4	10	35	18	22.99	25.37	24.18
168	E, 9th Regiment	47	19	7	7	5	28	22.44	24.25	23.35
169	Sixth Battery	65	43	17	19	7	22	.....	45.85	22.93
170	H, 69th Regiment	100	34	8	15	11	66	25.17	19.20	22.19
171	D, 10th Battalion	53	27	15	8	4	26	.....	38.86	19.43
172	I, 11th Regiment	55	24	3	5	16	31	20.43	16.73	18.58
173	Eighth Separate	59	26	13	10	3	33	.....	33.20	16.61
174	C, 14th Regiment	43	14	9	4	1	29	.....	26.98	13.49
175	H, 14th Regiment	47	15	8	5	2	32	.....	24.25	12.13
176	Fifth Separate	58	27	4	10	13	31	.....	21.72	10.86
177	G, 14th Regiment	54	13	8	3	2	41	.....	18.88	9.44
178	E, 14th Regiment	58	12	5	5	2	46	.....	14.48	7.24
179	F, 8th Regiment	55	9	2	4	3	46	.....	9.09	4.55
180	Thirteenth Separate	53	0	0	0	0	53	No	prac	tice.
181	Twenty-fourth Separate	63	0	0	0	0	63	No	prac	tice.
182	Twenty-fifth Separate	31	0	0	0	0	31	No	prac	tice.
183	Twenty-eighth Separa'e	68	0	0	0	0	68	No	prac	tice.
184	Fortieth Separate	69	0	0	0	0	69	No	prac	tice.
185	Forty-first Separate	70	0	0	0	0	70	No	prac	tice.
186	Forty-third Separate	74	0	0	0	0	74	No	prac	tice.

MARKSMEN.

The following members of the National Guard have qualified as marksmen during the year 1887; those qualifying for the thirteenth time being printed in *italics*, the star (thus *) designates sharp-shooters, viz.: those having made in 1887 scores of forty-two points and upward:

GENERAL STAFF AND STAFF DEPARTMENTS.

Reported as qualifying during the year 1887.

RANK.	Name.	Position.	Scores.			Date of qualification.	If match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Colonel	P. P. Beals*	D. R. P.	23	25	48	Sept. 17	C. M. C.	7
Brig.-General	Charles F. Robbins.*	G. I. R. P.	21	23	44	July 30	C. M. C.	11
Lieut.-Colonel	*F. C. McLewe**	A. I. G.	19	24	43	Aug. 13	C. M. C.	12
Colonel	E. B. Ten Broeck	P. D.	17	17	34	Nov. 10	.....	4
Colonel	John Bodine	Asst. G.I.R.P.	19	14	33	Oct. 15	C. M. C.	11
Colonel	E. L. Judson	A. D. C.	15	15	30	Oct. 11	.....	1
Colonel	*Joseph G. Story*	O. D.	18	9	27	Aug. 30	.....	12

Total..... 7.

SUPERNUMERARY.

RANK.	Name.	Position.	Scores.			Date of qualification.	If match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Major	H. C. Brown*	.....	21	24	45	Aug. 27	C. M. C.	10
Lieut.-Colonel	Robert Olyphant	.....	19	20	39	May 14	.....	10
Brig.-General	E. O. Beers	.....	17	20	37	Oct. 5	.....	8
Colonel	*E. A. Rockwood*	.....	18	15	33	Aug. 20	C. M. C.	12
Captain	L. d'Ovemieux	.....	17	15	32	May 14	.....	1
Captain	F. T. Leigh	.....	17	14	31	Nov. 8	C. M. C.	1
Lieutenant	W. W. Ryder	.....	12	18	30	Oct. 29	C. M. C.	11
Major	Lloyd Aspinwall	.....	13	14	27	May 14	.....	3
Major	W. F. Morgan	.....	12	13	25	May 14	.....	3
Lieutenant	J. H. Dunscombe	.....	13	12	25	Oct. 29	C. M. C.	4

Total..... 10.

FIRST BRIGADE.

(Figure of merit..... 47.98.)

GENERAL AND STAFF.

(Figure of merit..... 83.33.)

RANK.	Name.	Position.	Scores.			Date of qualification.	If match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Major	C. H. Eagle	I. R. P.	23	21	44	Sept. 14	C. M. C.	11
Major	A. P. Montaut	Inspector	19	14	33	May 16	.....	...
Lieut.-Colonel	T. H. Barber	A. A. G.	16	15	31	May 16	.....	...
Major	R. V. McKim	Surgeon	15	15	30	May 16	.....	4
Major	Paul Dana	O. O.	13	16	29	May 16	.....	4
Lieut.-Colonel	B. S. Church	Engineer	12	14	26	Oct. 13	.....	1
Major	S. H. Olin	Com.	13	13	26	May 16	.....	3
Brig.-General	Louis Fitzgerald	.....	19	7	26	May 16	.....	9
Captain	W. E. Roosevelt	A. D. C.	14	11	25	May 16	.....	3
Captain	F. R. Appleton	A. D. C.	14	11	25	May 16	.....	4

Total..... 10.

SEVENTH REGIMENT.

(Figure of merit..... 78.70.)

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Sergeant	W. J. Underwood *	H	23	24	47	Sept. 15	All comers	9
Second Lieut.	E. F. Young *	C	23	24	47	Sept. 14	N. Y. State	5
Captain	W. H. Palmer * (I. R. P.)	Staff.	22	24	46	Sept. 14	All comers	10
Private	G. L. Hoffman *	H	22	24	46	Sept. 15	All comers	2
Private	J. D. Foot *	F	23	23	46	July 30	M. B.	1
Private	C. A. Jones *	G	23	23	46	Aug. 13	M. B.	10
Private	C. W. Thom *	F	24	22	46	July 16	M. B.	3
Private	R. M. Kallock *	H	24	22	46	Aug. 13	M. B.	4
Private	O. E. Dudley *	F	20	25	45	Oct. 15	M. B.	2
Private	W. A. Bryant *	H	21	24	45	Sept. 14	All comers	9
Private	J. P. M. Richards *	G	21	24	45	Oct. 1	M. B.	5
First Sergt.	R. McLean *	K	22	23	45	Sept. 17	All comers	5
Second Lieut.	S. W. Merritt *	B	22	23	45	June 11	M. B.	6
Private	A. Stein *	C	20	24	44	Oct. 29	M. B.	....
Private	R. L. Major *	I	20	24	44	Oct. 29	M. B.	4
Private	W. L. Thompson *	I	20	24	44	Nov. 10	.....	3
Corporal	R. M. Dunn *	G	20	24	44	Nov. 8	M. B.	2
Private	*G. F. Merchant* *	H	20	24	44	July 30	M. B.	12
Private	F. S. Kennedy *	F	21	23	44	Aug. 27	M. B.	4
Sergeant	E. W. Price * (O. S.)	N.C.S.	22	22	44	Sept. 5	.....	11
First Sergt.	A. McDougall *	C	22	22	44	Sept. 14	All comers	7
Private	J. M. Tallman *	A	22	22	44	Aug. 6	M. B.	4
Corporal	A. W. Trotter *	E	22	22	44	Aug. 27	M. B.	3
Corporal	W. A. Dixon *	G	23	21	44	Aug. 27	M. B.	5
Corporal	J. N. Munson *	G	19	24	43	July 30	M. B.	5
Sergeant	A. L. Ely *	G	20	23	43	Sept. 17	All comers	8

SEVENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Sergeant	T. A. Bartley*	H	20	23	43	July 4	M. B.	9
Private	C. H. Hoyt*	I	20	23	43	Aug. 27	M. B.	5
Q. M. Sergt	H. B. Thompson*	C	21	22	43	Aug. 6	M. B.	10
Private	H. E. Chapman*	K	21	22	43	Aug. 27	M. B.	3
Private	P. L. Klock*	H	21	22	43	Oct. 29	M. B.	1
Private	B. D. Dark*	G	21	22	43	Aug. 27	M. B.	4
Sergeant	F. Van Lennep*	K	21	22	43	Aug. 6	M. B.	2
Private	D. Bacon*	K	22	21	43	July 16	M. B.	3
Private	F. A. Ehrt*	C	23	20	43	Sept. 15	All comers.	
Private	J. W. Cochran*	B	19	23	42	July 16	M. B.	5
Corporal	J. W. Cleveland*	I	20	22	42	May 19		4
Private	G. L. Stebbins*	K	20	22	42	Sept. 15	All comers.	1
Private	F. W. Perkins*	F	20	22	42	Nov. 8	M. B.	
Private	C. C. Brown*	I	21	21	42	June 11	M. B.	5
Captain	*J. C. Abrams**	G	21	21	42	May 17		12
Sergeant	E. R. Richards*	D	21	21	42	Nov. 8	M. B.	3
Private	H. H. Snios*	G	21	21	42	Sept. 13	All comers.	5
Captain	A. W. Conover*	A	22	20	42	Aug. 27	M. B.	11
Sergeant	W. E. Starr	H	19	22	41	Nov. 8	M. B.	8
Private	A. G. Scranton	F	19	22	41	July 4	M. B.	6
Private	H. R. Browne	C	19	22	41	May 17		5
Private	E. C. Schoonmaker	D	19	22	41	Sept. 15	All comers.	5
Private	C. F. Brinck	B	19	22	41	May 16		4
Private	G. C. Power	K	20	21	41	Oct. 29	M. B.	8
Private	W. P. Wainwright, Jr.	K	20	21	41	July 4	M. B.	1
Private	T. O. Thompson	F	20	21	41	May 16		1
Private	H. C. Titus	H	21	20	41	May 19		11
Sergeant	D. Valentine, Jr	B	21	20	41	May 16		8
Private	A. Bertrand	C	22	19	41	Oct. 15	M. B.	4
Private	F. A. Burr	K	23	18	41	Oct. 15	M. B.	4
Private	R. H. Goffe, Jr	C	19	21	40	May 17		4
Private	J. B. Elmendorf	G	19	21	40	July 4	M. B.	3
Private	J. Miller	F	19	21	40	July 30	M. B.	
First Sergt	*J. B. Holland*	H	20	20	40	May 19		12
Private	F. A. Potts, Jr	B	20	20	40	May 16		4
Private	C. E. Chapman	K	21	19	40	June 11	M. B.	1
Private	G. DuVal	I	17	22	39	July 30	M. B.	
Sergeant	J. D. Ford	F	18	21	39	May 16		9
Sergeant	B. W. Anderson	B	18	21	39	July 30	M. B.	7
Sergeant	J. K. Green (R. G. G.)	N.C.S	19	20	39	Aug. 13	M. B.	9
First Lieut	J. B. Dewson	G	20	19	39	Aug. 13	M. B.	11
Private	C. M. Benedict	B	20	19	39	May 16		1
Private	G. D. Beattys	B	21	18	39	July 30	M. B.	
Corporal	J. M. French	I	22	17	39	May 19		5
Private	H. R. Baldwin	A	15	23	38	Aug 27	M. B.	1
Corporal	A. M. Hearn	C	17	21	38	May 17		5
Private	H. W. Janssen	A	17	21	38	May 16		1
Private	A. L. Lesher	I	17	21	38	Nov. 8	M. B.	1
Private	J. G. Bert	C	18	20	38	May 17		11
Corporal	C. L. True	B	18	20	38	May 16		6
Corporal	J. A. Morton	K	18	20	38	May 19		4
Corporal	W. H. Macfarlan	F	19	19	38	May 16		4
Private	C. Coster	I	19	19	38	Sept. 5		
Private	N. Morris	K	20	18	38	Aug. 13	M. B.	
Private	H. J. Dietz	B	20	18	38	Oct. 1	M. B.	
Private	W. S. Righter	G	15	22	37	May 17		7
Private	H. B. Boyd	K	16	21	37	June 11	M. B.	4
Captain	D. Appleton	F	17	20	37	May 16		9
Private	C. E. Maxfield	F	17	20	37	May 16		2
Private	R. C. Page	B	17	20	37	June 11	M. B.	
Private	S. S. Chauncey	I	18	19	37	Oct. 15	M. B.	4
Private	E. Y. Weber	I	18	19	37	May 19		4
Corporal	M. H. Smith, Jr	F	18	19	37	May 16		2
Sergt. Major	*W. B. Coughtry*	N.C.S	19	18	37	May 16		12
Private	J. R. Dederer	F	19	18	37	July 16	M. B.	10
Private	A. D. Dederick	E	19	18	37	May 17		4
First Sergt	W. N. Vail	I	20	17	37	May 19		5
Private	H. E. Fox	D	20	17	37	Aug. 6	M. B.	3
Private	C. Gottschalk	C	20	17	37	May 17		1
Private	T. Wilson	A	21	16	37	May 16		4

SEVENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	W. S. Black	H	21	16	37	May 19		1
Private	H. N. Camp, Jr.	K	12	24	36	May 19		1
Private	J. Bleecker, Jr	K	15	21	36	May 19		3
Private	L. C. Connolly	D	15	21	36	Aug. 13	M. B.	1
Private	J. F. Hobart	B	16	20	36	Sept. 5		1
First Lieut	A. E. Allen	D	17	19	36	May 17		4
Private	A. J. Vaast	E	17	19	36	June 11	M. B.	1
Sergeant	G. G. Stow (S. B.)	N.C.S	18	18	36	May 16		10
Private	A. E. Hoyt	B	18	18	36	May 16		3
Corporal	R. McWilliam	A	18	18	36	May 16		2
Private	C. D. Murphy	D	18	18	36	Sept 5		2
Private	J. H. Lee	C	18	18	36	May 17		1
Q. M. Sergt	E. W. Burnette	F	19	17	36	May 16		10
Captain	A. Mills	H	19	17	36	May 19		10
Private	W. E. Marcus	F	19	17	36	May 16		8
First Lieut	D. A. Nesbit	B	19	17	36	Aug. 13	M. B.	8
Corporal	H. C. Lima	D	19	17	36	May 17		1
Private	J. W. Salter, Jr	H	19	17	36	June 11	M. B.	1
Private	M. K. Miller	H	19	17	36	May 19		
Private	Q. H. Blackmar	C	19	17	36	May 17		
Private	J. Wotherspoon	H	20	16	36	May 19		4
Private	E. W. Berge	A	20	16	36	Nov. 8	M. B.	1
Private	J. A. Davidson	H	20	16	36	May 19		1
Private	C. W. Lindsley	F	21	15	36	May 16		2
Corporal	J. H. Clark	B	22	14	36	May 16		5
Private	H. C. Taylor	K	14	21	35	May 19		4
Private	A. E. Pressinger	E	14	21	35	May 17		2
Private	G. F. Carll	F	15	20	35	May 16		6
Private	J. J. Higgins	G	15	20	35	May 17		6
Private	E. W. Kemble	C	15	20	35	Sept. 5		4
Private	G. E. Sterry, Jr	I	15	20	35	Nov. 8	M. B	
First Lieut	W. S. Wilson	E	16	19	35	May 17		8
Private	W. B. Hardy	G	16	19	35	Aug. 27	M. B	1
Private	C. E. M. Hodge	F	16	19	35	Sept. 5		1
Private	H. J. Schumacher	F	16	19	35	May 16		1
Private	H. W. Fish	H	16	19	35	Nov. 8	M. B	
Private	H. J. Hall	I	16	19	35	Nov. 8	M. B	
Private	C. S. McVey	G	17	18	35	May 17		2
Private	W. M. Baldwin	K	17	18	35	May 19		2
Private	H. F. Clark	B	17	18	35	Oct. 1	M. B	
Corporal	E. C. Denison	I	18	17	35	May 19		4
Private	J. Miller	C	18	17	35	Sept. 5		4
Private	R. C. Corner	B	18	17	35	Sept. 5		3
Corporal	G. M. Gray	K	18	17	35	May 19		3
Private	W. E. Mead	G	18	17	35	Sept. 5		
Corporal	C. F. Bement	A	19	16	35	Sept. 5		5
Private	E. M. Semple	F	19	16	35	May 16		5
Private	F. M. Orton	G	19	16	35	Nov. 10		
Private	T. W. Linton	H	20	15	35	May 16		5
Private	B. F. Goodspeed	F	20	15	35	Sept. 5		2
Private	R. Darling	A	20	15	35	May 16		2
Private	G. Kemble, Jr	F	20	15	35	June 11	M. B	2
Private	W. S. Mills	K	20	15	35	Oct. 29	M. B	
Private	D. A. McLeod	H	21	14	35	Oct. 1	M. B	8
Private	G. W. Happy	B	21	14	35	May 16		7
Sergeant	G. E. Moore	I	22	13	35	May 19		11
Private	E. Mildeberger	I	12	22	34	May 19		4
Private	D. A. Smith	D	12	22	34	Oct. 1	M. B	3
Sergeant	W. P. Atkinson	G	12	22	34	Nov. 8	M. B	
Private	R. S. Holt, Jr	H	13	21	34	May 28	M. B	5
Private	H. H. Arthur	F	14	20	34	July 30	M. B	4
Private	J. B. Roy	K	15	19	34	July 30	M. B	5
Private	C. M. Conyers	G	15	19	34	May 17		
Captain	H. S. Steele	B	16	18	34	July 4	M. B	10
Corporal	F. W. Rudd	F	16	18	34	Aug. 6	M. B	6
Private	T. R. Barton	A	16	18	34	Aug. 27	M. B	4
Private	D. C. Meyer	C	16	18	34	Aug. 13	M. B	3
Private	G. L. Schuhler, Jr	B	16	18	34	May 16		3
Private	A. T. Moore	E	16	18	34	Sept. 17	All comers.	2
Private	C. F. Bostwick	B	16	18	34	May 16		1

SEVENTH REGIMENT—*(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualification.
			200 yards.	500 yards.	Total.			
First Lieut	J. A. Tackaberry	H	17	17	34	May 19		10
Captain	L. E. Lefferts	K	17	17	34	May 19		9
Private	Richard H. Lawrence	I	17	17	34	May 19		5
Private	G. A. Yost	A	17	17	34	Aug. 27	M. B	4
Private	F. H. Crary	H	17	17	34	June 11	M. B	3
Private	S. H. Brown	K	17	17	34	Nov. 8	M. B	1
Private	G. McLean	E	17	17	34	May 17		
Private	E. C. Powles	H	18	16	34	May 19		3
Private	F. E. Langford	F	18	16	34	May 16		2
Private	J. Bain, Jr	D	18	16	34	May 17		1
Private	F. G. McDougall	B	18	16	34	May 16		1
Private	W. A. Ransom, Jr	C	18	16	34	May 17		1
Private	H. R. Brinckerhoff	F	18	16	34	Nov. 8	M. B	
Corporal	W. A. Valentine	F	19	15	34	May 16		7
Corporal	J. A. Jenkins	B	19	15	34	May 16		5
Sergeant	F. H. Clark	D	19	15	34	May 17		4
Corporal	W. D. Leonard	B	19	15	34	May 16		4
Private	G. F. Pelham	H	19	15	34	May 19		2
Corporal	J. V. Black	B	20	14	34	May 16		7
Sergeant	J. W. Carter	C	20	14	34	June 11	M. B	6
Private	F. McM. Stanton	A	20	14	34	Oct. 15	M. B	4
Sergeant	A. E. White	K	20	14	34	May 28	M. B	4
Private	J. Baker	F	20	14	34	Oct. 29	M. B	2
Private	C. C. Moore, Jr	H	20	14	34	Sept. 5		2
Private	C. G. Howard	E	21	13	34	May 17		3
First Lieut	J. W. McDougall	C	14	19	33	July 30	M. B	10
Private	R. Chambers	B	14	19	33	May 16		6
Private	J. S. Dodge	C	14	19	33	May 17		5
Private	T. J. O Rhinelander	K	14	19	33	Oct. 1	M. B	1
Private	R. Lindner	H	15	18	33	June 11	M. B	3
Private	A. F. Townsend	F	15	18	33	May 16		
Private	W. B. Allbright	C	15	18	33	Nov. 8	M. B	
First Lieut	*G. W. Rand* (Adj't)	Staff,	16	17	33	May 16		12
Private	H. O. Tallmadge	I	16	17	33	Sept. 5		4
Corporal	J. J. White, Jr	K	16	17	33	May 28	M. B	4
Private	R. N. Kenyon	H	16	17	33	May 19		4
Private	G. H. Floto	D	16	17	33	May 17		3
Private	J. H. W. Strong	K	16	17	33	May 19		
Private	C. F. Burhans	B	16	17	33	Oct. 29	M. B	
Private	J. F. Baudouine	B	16	17	33	Oct. 29	M. B	
Private	F. W. Pope	C	17	16	33	May 17		4
Private	Robert H. Lawrence	I	17	16	33	July 4	M. B	3
Private	R. D. Neeson	B	17	16	33	May 16		1
Private	J. M. Hare	E	17	16	33	May 17		1
Private	A. C. Ketcham	K	17	16	33	Oct. 29	M. B	
Private	L. E. Lahens	K	17	16	33	Sept. 5		
Private	J. Ruppert, Jr	B	17	16	33	Oct. 15	M. B	
Corporal	F. W. Colwell	F	18	15	33	Oct. 15	M. B	4
Private	W. M. Halsted	B	18	15	33	May 16		3
Private	R. Jacob	K	18	15	33	May 19		1
Private	E. J. Heppenheimer	C	18	15	33	May 17		
Private	J. E. McNicol	C	19	14	33	May 17		11
Sergeant	W. H. Heisser (C. S.)	N.C.S	19	14	33	May 16		10
Private	A. P. Hinton	K	19	14	33	Oct. 15	M. B	4
Private	E. W. Gould, Jr	A	19	14	33	Sept. 15	All comers	3
Private	J. H. Seymour	H	19	14	33	May 19		3
Private	F. B. Gillespie	G	19	14	33	Sept. 5		2
Corporal	W. H. Journeay	C	20	13	33	May 17		4
Q. M. Sergt	C. L. Waterbury	K	20	13	33	Sept. 17	All comers	4
Private	N. Barbour	A	21	12	33	Oct. 15	M. B	3
Private	G. W. Lewis	I	12	20	32	May 19		10
Private	G. Bain	D	13	19	32	Oct. 15	M. B	1
Private	C. W. Smith, Jr	I	13	19	32	May 19		
Private	G. J. Kilgen	B	13	19	32	Sept. 5		
Private	W. L. Townsend	D	13	19	32	Sept. 5		
Private	E. H. Gouge	G	14	18	32	July 30	M. B	4
Private	A. L. North	C	14	18	32	July 16	M. B	3
Private	J. W. A. Abell	E	14	18	32	May 17		1
Sergeant	T. B. Veeder	D	15	17	32	May 17		6
Private	G. D. Baird	F	15	17	32	July 30	M. B	

SEVENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	G. F. Wiepert	G	15	17	32	Aug. 13	M. B.	....
Corporal	W. A. Taylor	I	16	16	32	May 19		8
Sergeant	H. S. Clark	K	16	16	32	May 19		6
Corporal	J. H. Townsend	H	16	16	32	May 19		3
Private	R. L. Kemble	K	16	16	32	June 11	M. B.	2
Private	I. S. Douglass	C	16	16	32	May 17		1
Private	C. E. Warren	I	16	16	32	May 28	M. B.	1
Private	C. P. Sackett	F	16	16	32	May 16		1
Private	M. L. Ransom	G	16	16	32	Oct. 1	M. B.	....
Private	E. P. Jenkins	A	16	16	32	May 16		....
Private	C. G. Halliday	D	16	16	32	May 17		....
Private	L. Sands	B	16	16	32	May 17		....
Private	S. H. Rich	A	16	16	32	Oct. 15	M. B.	....
Private	M. C. Patterson	B	17	15	32	May 16		7
Corporal	A. F. Pfeiffer	E	17	15	32	May 17		3
Private	G. L. Androus	E	17	15	32	Sept. 5		3
Private	A. Hebbard, Jr	I	17	15	32	May 19		2
Sergeant	W. E. C. Mayer	E	17	15	32	May 17		2
Private	C. F. Wiebusch	K	17	15	32	May 19		2
Private	D. P. Stanton	G	17	15	32	May 17		1
Private	C. Stillman	K	17	15	32	May 19		....
Private	H. H. Knox	A	18	14	32	May 16		4
Private	G. D. Pitman	F	18	14	32	May 16		4
Private	O. D. Thess	E	18	14	32	May 17		4
Sergeant	A. L. Wickert (L. G. G.)	N.G.S	18	14	32	Sept. 5		4
Private	E. E. Poor, Jr	F	18	14	32	Nov. 10		4
Private	C. Lembke, Jr	D	18	14	32	July 30	M. B.	3
Private	T. S. Draper	C	18	14	32	Oct. 15	M. B.	2
Private	T. J. Blanck, Jr	B	18	14	32	Nov. 8	M. B.	1
Private	S. D. Folsom	I	19	13	32	Oct. 15	M. B.	9
First Lieut	J. F. Long (Q. M.)	Staff	19	13	32	May 16		7
Sergeant	J. E. Schuyler	B	19	13	32	May 16		6
Private	J. G. How	K	19	13	32	May 19		4
Private	M. B. Snevily	G	19	13	32	Oct. 29	M. B.	4
Private	W. F. H. Tupper	G	19	13	32	Oct. 15	M. B.	3
Private	W. J. Schieffelin	K	19	13	32	May 19		2
Private	E. E. Mapes	F	19	13	32	Aug. 27	M. B.	....
Private	E. R. Raynor	A	20	12	32	May 16		4
Private	W. E. Livingston	K	20	12	32	Oct. 29	M. B.	1
Private	A. J. Woods	G	21	11	32	Aug. 13		1
Private	W. E. Hume	A	11	20	31	May 16		2
Private	C. H. Cadwell	F	12	19	31	May 16		6
Private	G. F. Bates	H	13	18	31	Nov. 8	M. B.	7
Private	L. H. Allen	B	13	18	31	June 11	M. B.	4
Private	W. M. Clarke	G	14	17	31	July 16	M. B.	3
Private	R. T. Varnum	K	14	17	31	Sept. 5		2
Private	L. J. Phelps	K	14	17	31	May 19	M. B.	1
Private	I. R. D. Grubb	G	14	17	31	Nov. 8	M. B.	....
Corporal	G. H. Crawford	B	15	16	31	May 16		8
First Lieut	W. G. Schuyler (Com'y)	Staff	15	16	31	Oct. 15	M. B.	3
Corporal	A. C. Clayton	I	15	16	31	May 19		5
Private	J. A. O'Connor	G	15	16	31	Oct. 15	M. B.	5
Corporal	W. H. Allen	K	15	16	31	May 19		4
Private	E. A. Richard	I	15	16	31	May 19		7
Private	W. W. Gillespie	D	15	16	31	Sept. 5		....
Private	F. V. Houstan	D	15	16	31	Sept. 5		....
Private	C. Macfarlan	F	15	16	31	Sept. 5		....
Second Lieut	J. E. Ware	B	16	15	31	May 16		9
Sergeant	G. W. Rosevelt, Jr	A	16	15	31	Oct. 15	M. B.	8
First Lieut	F. Pawling	F	16	15	31	May 16		5
Corporal	G. W. Romaine	D	16	15	31	May 17		4
Corporal	C. L. Winters	G	16	15	31	Oct. 15	M. B.	4
Private	A. Rasch	B	16	15	31	May 16		4
Corporal	G. Lucas	G	16	15	31	June 11	M. B.	1
Private	W. B. Randall	H	16	15	31	July 4	M. B.	....
Sergeant	E. McCoy	C	17	14	31	May 17		10
First Lieut	J. E. Schermerhorn	K	17	14	31	May 19		10
Private	L. G. Frankau	E	17	14	31	May 17		7
Corporal	O. Moehle	A	17	14	31	May 16		5
First Sergt	H. M. Nesbitt	B	17	14	31	June 11	M. B.	5

SEVENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	C. S. Chapman	A	17	14	31	May 16		4
Private	H. S. Brevoort	C	17	14	31	Oct. 1	M. B.	3
Corporal	G. J. Weaver	I	17	14	31	May 19		2
Private	C. P. Kirkland	K	17	14	31	May 19		
Private	W. Buhler, Jr.	A	17	14	31	May 16		
Private	N. W. Vanderhoef	I	17	14	31	May 19		
Private	A. H. Van Buskirk	B	17	14	31	Oct 29	M. B.	
Private	G. W. Thatcher, Jr.	F	18	13	31	May 16		6
Private	L. E. Harmon	E	18	13	31	Sept. 5		3
Private	C. Monroso	A	18	13	31	Sept. 5		2
Private	P. I. Lowd	E	18	13	31	Sept. 5		1
Private	F. W. Pohle	D	18	13	31	Sept. 5		1
Private	E. G. Schermerhorn	I	18	13	31	May 19		1
Private	A. H. Smith	C	18	13	31	June 11	M. B.	
Private	Z. Mayhew	H	19	12	31	May 28	M. B.	7
Private	E. T. Palmenberg	A	19	12	31	May 16		2
Corporal	M. I. Fox	E	19	12	31	Sept. 5		1
Private	R. D. McGreevey	G	19	12	31	July 16	M. B.	1
Private	J. W. Halstead	C	19	12	31	May 17		
Private	F. Blanchard	D	20	11	31	July 16	M. B.	3
Private	H. A. Bostwick, Jr.	B	20	11	31	May 16		2
Corporal	A. H. Walton	A	20	11	31	May 16		1
Second Lieut.	W. B. Bradley	E	21	10	31	May 17		3
Corporal	J. W. Dowling, Jr.	K	21	10	31	May 19		3
Private	C. S. Bussé	F	21	10	31	May 16		2
Private	W. H. Toll	E	21	10	31	May 17		2
Private	J. G. Farnsworth, Jr.	K	7	23	30	May 19		1
Second Lieut.	G. H. Gould	I	12	18	30	May 19		10
Private	W. H. Ketcham	H	12	18	30	May 19		3
Private	D. W. McRae	C	12	18	30	May 17		
Major	D. M. Stimson (Surg.)	Staff	13	17	30	May 16		8
Private	J. H. Davidson	C	13	17	30	May 17		8
Private	C. H. Brigham	B	13	17	30	Nov. 8	M. B.	4
Corporal	G. W. Robinson	D	14	16	30	Sept. 13	All comers	7
Private	C. L. Comfort	F	14	16	30	May 16		5
Private	H. D. Miles	B	14	16	30	May 16		4
Corporal	G. E. Wyeth	K	14	16	30	May 19		3
Corporal	J. Kidney	E	14	16	30	Sept. 5		
Sergeant	T. Guerra	C	15	15	30	June 11	M. B.	6
Corporal	C. A. Appleton	F	15	15	30	May 16		4
Private	W. D. Byron	D	15	15	30	July 30	M. B.	3
Sergeant	C. Cook	A	15	15	30	Sept. 5		4
Private	F. M. Haviland	B	15	15	30	May 16		3
Private	W. W. Martin	G	15	15	30	June 11	M. B.	2
Sergeant	F. Koch	E	15	15	30	May 17		2
Private	P. Hayes	C	15	15	30	May 17		1
Private	W. Heyerdahl	C	15	15	30	Sept. 5		
Private	R. E. Parraga	A	16	14	30	May 16		5
Sergeant	T. Babcock, Jr.	F	16	14	30	May 16		5
Private	A. V. Castellanos, Jr.	C	16	14	30	May 17		1
Private	F. J. Burke	E	16	14	30	May 17		1
Private	W. V. Stevens	F	16	14	30	Oct. 15	M. B.	
Private	U. Adams, Jr.	D	16	14	30	May 17		
Private	J. Corner	H	16	14	30	Oct. 1	M. B.	
Private	O. T. Wenige	D	16	14	30	May 17		
Private	H. L. Hotchkiss, Jr.	I	16	14	30	Oct. 29	M. B.	
Corporal	E. Dutcher	H	17	13	30	May 19		10
Sergeant	S. M. Warnock	H	17	13	30	May 19		9
Corporal	C. P. Gately	B	17	13	30	May 16		5
Private	J. W. Myers	B	17	13	30	May 16		4
Private	W. J. Andrus	H	17	13	30	May 19		3
Private	F. A. Ware	B	17	13	30	May 16		2
Private	W. F. Baxter	D	17	13	30	Nov. 8	M. B.	1
Private	R. J. Chatry	F	17	13	30	Aug. 6	M. B.	
Private	E. J. Chaffee, Jr.	I	17	13	30	May 19		
Private	S. S. Van Kirk	C	17	13	30	Oct. 29	M. B.	
Private	R. F. Morrison	B	18	12	30	Sept. 5		5
Private	E. Scheitlin, Jr.	H	18	12	30	June 11	M. B.	5
Sergeant	W. G. Bates	K	18	12	30	May 19		4
Private	A. R. Angell	H	18	12	30	May 19		2

SEVENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	R. A. Stacpoole	B	18	12	30	May 16		2
Private	D. L. Cobb	C	18	12	30	Oct. 15	M. B.	1
Private	B. F. Lent	D	18	12	30	July 30	M. B.	....
First Sergt	H. E. Zittel	E	19	11	30	Sept. 5		5
Corporal	A. Wangler	H	19	11	30	May 19		4
Private	F. McCoy	C	19	11	30	June 11	M. B.	3
Private	C. S. Campbell	K	19	11	30	Sept. 5		....
Private	G. L. Smith	I	19	11	30	Nov. 8	M. B.	....
Private	C. W. Macdonald	F	20	10	30	Sept. 5		3
Second Lieut.	W. F. Peck	F	21	9	30	May 16		5
Private	M. Osborn	I	21	9	30	Nov. 8	M. B.	2
Private	H. Janes	I	21	9	30	May 19		1
Corporal	W. A. Jones	H	22	8	30	May 19		6
Private	F. G. Evans	I	8	21	29	Oct. 15	M. B.	1
Private	W. P. Clagett	I	10	19	29	May 19		....
Private	A. Ayers	B	11	18	29	Aug. 13	M. B.	2
Private	O. Freeman	H	11	18	29	May 19		2
Private	E. R. Carter	G	11	18	29	Aug. 13	M. B.	1
Private	F. Seggerman	B	11	18	29	Aug. 16	M. B.	1
Private	A. De Saldern	H	12	17	29	May 19		4
Private	L. M. Segee	G	12	17	29	May 17		3
Private	G. S. Loder	H	12	17	29	Oct. 29	M. B.	2
Corporal	G. A. Gardner	D	12	17	29	May 17		1
Corporal	F. D. Pelton	F	12	17	29	May 16		....
Major	W. H. Kipp	Field	13	16	29	May 19		10
Second Lieut.	E. T. Kirkland	K	13	16	29	May 19		4
Private	W. C. Ely	I	13	16	29	May 19		....
Private	D. S. Cameron	K	13	16	29	Sept. 5		....
Private	C. Roos	B	14	15	29	May 16		5
Private	J. W. Butler	C	14	15	29	May 17		4
Private	J. M. Hayward	C	14	15	29	May 17		4
Private	H. C. Miller	E	14	15	29	May 17		2
Private	B. B. Sloan	K	14	15	29	Oct. 29	M. B.	2
Private	J. Laimbeer, Jr.	G	14	15	29	Aug. 27	M. B.	1
Private	H. A. Pomroy	I	14	15	29	May 19		....
Private	R. P. Barron	A	15	14	29	May 16		5
Private	B. F. Hillery	C	15	14	29	Oct. 1	M. B.	5
Private	J. Spies	C	15	14	29	July 4	M. B.	5
Corporal	J. W. B. Rockwell	G	15	14	29	May 17		4
Private	J. R. Cummings	A	15	14	29	May 16		4
Private	L. J. Joscelyn	H	15	14	29	June 11	M. B.	3
Private	E. Horton	I	15	14	29	Sept. 5		3
Private	H. Desendorf	F	15	14	29	May 16		1
Private	W. M. Moore	I	15	14	29	Sept. 5		1
Private	H. Batjer, Jr	H	15	14	29	May 19		1
Private	L. Bender	C	15	14	29	May 17		....
Private	H. H. Whitlock	I	15	14	29	June 11	M. B.	....
Second Lieut.	C. E. Lydecker	H	16	13	29	May 19		10
Sergeant	O. Mussinan, Jr	D	16	13	29	May 17		5
Private	A. Fitch	C	16	13	29	May 17		4
Private	J. F. Slade	K	16	13	29	May 19		4
Private	J. C. Wohlfert	E	16	13	29	Sept. 5		4
Private	G. H. Barlow	F	16	13	29	May 16		3
Private	H. C. Jones	G	16	13	29	Sept. 5		3
Private	G. Clark, Jr	H	16	13	29	May 19		2
Private	R. P. Getty, Jr	F	16	13	29	Nov. 10		1
Private	H. C. Adams	B	16	13	29	May 16		1
Private	J. B. Hibbard, Jr	F	16	13	29	July 30	M. B.	....
Private	E. C. Lambert	K	16	13	29	May 19		....
Corporal	W. T. Peterson	D	16	13	29	May 17		....
Private	H. W. Comegys	A	17	12	29	May 16		10
Sergeant	W. A. Jennings	E	17	12	29	Sept. 5		8
First Sergt.	H. H. Spelman	G	17	12	29	May 17		8
Private	H. V. D. Black	B	17	12	29	May 16		7
Private	W. C. B. Kemp	B	17	12	29	May 16		5
Second Lieut.	J. J. McKenna	A	17	12	29	May 16		5
Private	G. Karsch	H	17	12	29	Sept. 5		4
Private	W. H. Van Kleeck, Jr.	H	17	12	29	May 19		4
Private	O. A. Whipple	C	17	12	29	June 11	M. B.	4
Private	F. Keck	B	17	12	29	July 4	M. B.	4

SEVENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	W. F. Catterfield	I	17	12	29	May 19		3
Private	J. S. Herman	C	17	12	29	May 17		2
Private	H. G. Trevor	K	17	12	29	Oct. 1	M. B.	2
Private	H. L. Bloomfield	K	17	12	29	July 16	M. B.	....
Private	J. Gregory, Jr.	B	17	12	29	Sept. 5		....
Captain	H. D. Cooper	D	18	11	29	May 17		10
Sergeant	W. H. Folsom	I	18	11	29	May 19		9
Private	T. B. Patton	D	18	11	29	May 17		3
Private	W. T. Winsor	G	18	11	29	May 17		3
Private	J. R. Langdon	A	18	11	29	May 16		3
Private	B. S. De Garmendia	I	18	11	29	Oct. 29	M. B.	2
Private	W. H. Picken	A	18	11	29	Oct. 29	M. B.	....
Private	A. McLean, Jr.	E	18	11	29	May 17		....
Private	E. S. Allen	B	19	10	29	May 16		1
First Sergt.	T. A. Patteson, Jr.	D	19	10	29	July 30	M. B.	4
Private	G. B. Rumrill	D	19	10	29	May 17		....
Private	E. R. Lancaster	H	20	9	29	May 19		3
Private	W. J. A. Wellington	A	20	9	29	Sept. 5		3
Private	C. E. Milmine	A	20	9	29	May 16		....
Private	E. N. Nichols	F	21	8	29	May 16		4
Private	G. C. Whaley	E	21	8	29	May 17		1
Private	H. S. Taintor	D	10	18	28	Sept. 5		....
Private	G. M. Barretto	B	11	17	28	May 16		9
Corporal	C. L. Smith	C	11	17	28	May 17		3
Private	P. H. Carter	I	11	17	28	May 19		2
Private	F. G. Roumage	B	11	17	28	May 16		1
Private	H. G. McFaddin	E	12	16	28	Sept. 5		4
Private	C. L. Burnham	F	12	16	28	May 16		2
Private	F. P. Warren	D	12	16	28	May 17		2
Private	W. A. Cable	I	12	16	28	May 18		1
Private	G. G. Ward, Jr.	B	12	16	28	May 16		1
Private	F. Blume	E	12	16	28	Oct. 29	M. B.	....
Captain	G. B. Rhoads	E	13	15	28	Sept. 5		9
Private	J. W. Wood, Jr.	I	13	15	28	June 11	M. B.	5
Private	E. W. Bennett	C	13	15	28	Aug. 6	M. B.	2
Private	T. R. Simpson	D	13	15	28	May 17		1
Private	F. B. Silleck	H	13	15	28	May 19		1
Private	W. H. Frame	A	13	15	28	May 16		1
Private	C. H. Arnold	B	13	15	28	May 16		....
Private	F. E. Duffy	G	13	15	28	June 11	M. B.	....
Private	H. D. Steers	B	13	15	28	Sept. 5		....
Private	M. A. Merphy	D	13	15	28	Nov. 8	M. B.	....
Lieut.-Col	G. M. Smith	Field	14	14	28	May 17		10
Sergeant	H. W. Clements	H	14	14	28	June 11	M. B.	9
First Sergt	M. B. Stelle	F	14	14	28	May 16		5
Private	E. C. Anderson	A	14	14	28	May 16		2
Private	W. H. Whittal	G	14	14	28	Sept. 5		1
Corporal	G. Finck	G	14	14	28	May 17		....
Private	W. H. Lloyd	B	14	14	28	Oct. 29	M. B.	....
Private	W. F. Hall	D	14	14	28	Sept. 5		....
Private	H. W. Todd	G	14	14	28	Sept. 5		....
Private	R. Dart, Jr.	F	15	13	28	May 16		6
Private	C. Cowl	K	15	13	28	June 11	M. B.	3
Private	L. H. Luqueer	I	15	13	28	Oct. 29	M. B.	3
Private	F. Bensel	A	15	13	28	May 16		2
Private	N. C. Fisher	K	15	13	28	Oct. 29	M. B.	2
Private	J. W. Schelpert	E	15	13	28	May 17		1
Private	P. L. Livingston	K	15	13	28	Sept. 5		1
Private	G. H. Richards	B	15	13	28	Sept. 5		....
Private	A. Taylor	I	15	13	28	Nov. 8	M. B.	....
Private	W. A. Pratt	I	15	13	28	Oct. 15	M. B.	....
Private	J. A. Hunt	C	16	12	28	May 17		9
Corporal	W. R. Ware	F	16	12	28	May 16		6
Private	C. F. Muller	I	16	12	28	Oct. 29	M. B.	5
Private	A. Bastianelli	B	16	12	28	May 16		4
First Sergt	A. J. Eccles	A	16	12	28	Aug. 27	M. B.	4
Private	C. B. Little	H	16	12	28	May 19		1
Private	E. L. Gridley	B	16	12	28	Sept. 5		....
Private	F. S. Blackall	H	16	12	28	Oct. 29	M. B.	....
Private	A. G. Todd	G	16	12	28	Oct. 29	M. B.	....

SEVENTH REGIMENT — *(Continued.)*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	J. M. Monks	F	16	12	28	May 16		
Private	A. Shumway, Jr	H	17	11	28	May 19		8
Private	C. S. Goubert	B	17	11	28	May 16		4
Private	J. W. Scott	C	17	11	28	May 17		4
Private	N. Doyle	A	17	11	28	Aug. 27	M. B.	2
Private	A. De Cardenas	D	17	11	28	May 17		1
Private	G. H. Brown, Jr	K	17	11	28	Oct. 15	M. B.	1
Private	D. W. De Cardenas	D	17	11	28	May 17		
Private	L. B. Rader	C	17	11	28	June 11	M. B.	
Private	M. Crane, Jr	C	17	11	28	May 17		
Private	E. L. Armstrong	A	17	11	28	Sept. 5		
Colonel	E. Clark	Field	18	10	28	May 16		8
Corporal	T. M. Halsey	H	18	10	28	May 19		8
Private	R. P. Sherman	B	18	10	28	May 16		4
Private	C. McDougall, Jr	B	18	10	28	May 16		2
Private	H. T. Warren	G	18	10	28	Sept. 5		
Private	W. G. Richards	I	18	10	28	May 19		
Private	J. A. Brower	I	18	10	28	Oct. 15	M. B.	
Private	G. S. Towle	D	18	10	28	May 17		
Private	H. W. Allen	D	19	9	28	Sept. 5		3
Private	G. G. Brinckerhoff, Jr	F	19	9	28	Oct. 1	M. B.	3
Private	P. Kühne	K	19	9	28	Oct. 29	M. B.	2
Private	J. A. Tripler	G	19	9	28	May 17		2
Private	C. A. Hawley	F	19	9	28	Nov. 8	M. B.	
Private	S. A. Cooper	G	20	8	28	May 17		6
Private	W. R. Bassett	B	20	8	28	Aug. 13	M. B.	5
Private	W. A. McCreery	K	20	8	28	May 19		2
Private	F. Martin, Jr	H	7	20	27	Sept. 5		
Private	E. Martin, Jr	F	8	19	27	Oct. 1	M. B.	3
Private	J. A. Murray	A	9	18	27	May 16		3
Corporal	R. L. Roe	B	9	18	27	Aug. 6	M. B.	2
Second Lieut.	J. McGreevy	G	9	18	27	Oct. 15	M. B.	
Private	V. Youmans	C	10	17	27	Nov. 8	M. B.	
Private	W. Cunningham	B	11	16	27	July 30	M. B.	3
Private	H. P. Brush	G	11	16	27	Oct. 15	M. B.	2
Private	P. Rhinelander	K	11	16	27	Oct. 29	M. B.	2
Private	C. H. Gardner	D	11	16	27	Sept. 5		
Private	J. A. Livingston	E	12	15	27	May 17		5
Private	G. E. Fountain	B	12	15	27	May 16		4
Private	S. F. Lefferts	K	12	15	27	Aug. 27	M. B.	1
Private	J. M. Jones	B	12	15	27	Nov. 8	M. B.	1
Private	L. B. Burtnett	I	12	15	27	May 19		
Private	J. A. Neely	H	12	15	27	May 19		
Private	W. N. Edelsten	G	12	15	27	May 17		
Private	J. H. Taylor	F	12	15	27	July 4	M. B.	
Private	D. Betts	F	12	15	27	May 16		
Corporal	M. J. Fitzmahony	G	13	14	27	June 11	M. B.	5
Private	W. R. Chichester	C	13	14	27	May 17		4
Private	J. D. Thornton	E	13	14	27	May 17		3
Private	R. O. Pennell	D	13	14	27	July 30	M. B.	1
Private	C. H. Nichols	C	13	14	27	May 17		
Private	G. F. Spencer	G	13	14	27	Nov. 8	M. B.	
Private	E. L. Jones	K	13	14	27	May 28	M. B.	
Private	R. Deming	H	13	14	27	Oct. 29	M. B.	
Private	W. M. Morgan	H	14	13	27	May 19		9
Private	J. N. Stearns, Jr.	I	14	13	27	May 19		5
Private	W. N. Hoag	K	14	13	27	Aug. 27	M. B.	4
Private	T. F. Neal	I	14	13	27	May 19		4
Sergeant	W. V. A. Mulhallon	I	14	13	27	May 19		3
Private	C. T. Leonard	B	14	13	27	May 16		2
Private	J. T. Wainwright	K	14	13	27	May 19		2
Private	C. A. Gleason	E	14	13	27	May 17		1
Private	E. A. Casey	D	14	13	27	Sept. 5		1
Private	L. F. Ballard	D	14	13	27	July 4	M. B.	1
Private	D. M. Doremus	E	14	13	27	Oct. 15	M. B.	1
Private	G. A. Schastey, Jr	A	14	13	27	Sept. 5		
Private	L. W. McLeod	I	14	13	27	Sept. 5		
Private	R. D. Todd	H	14	13	27	Sept. 5		
Private	R. N. Goodrich	G	14	13	27	Nov. 8	M. B.	
Private	A. E. Rauch	E	14	13	27	Oct. 15	M. B.	

SEVENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
First Lieut.	H. C. Duval	I	15	12	27	May 19		10
Corporal	C. S. Clark	H	15	12	27	May 19		8
Private	J. W. Arthur	F	15	12	27	Nov. 8	M. B.	5
Private	C. A. Darling	F	15	12	27	May 16		3
Private	J. R. Stewart	B	15	12	27	May 16		3
Corporal	L. E. Vannier	A	15	12	27	May 16		2
Private	E. P. Jessup	F	15	12	27	May 16		1
Private	F. W. Rundle	C	15	12	27	Sept. 5		
Private	F. C. Wightman	A	15	12	27	Sept. 5		
Private	O. P. Turnbull	F	15	12	27	Aug. 6	M. B.	
Private	J. M. Mora	F	15	12	27	Aug. 27	M. B.	
Private	G. Vassar, Jr.	H	16	11	27	May 19		4
Corporal	W. Vores	E	16	11	27	May 17		4
Private	L. W. Miller	K	16	11	27	Oct. 15	M. B.	3
Private	H. H. Lemon	F	16	11	27	May 16		2
Sergeant	C. W. Kirby, Jr.	E	16	11	27	May 17		1
Private	H. J. Weber	B	16	11	27	Sept. 5		
Private	W. H. Brainard	C	16	11	27	July 16	M. B.	
Private	G. R. Burns	C	16	11	27	May 17		
Private	C. E. Bailey	D	16	11	27	Sept. 5		
Private	J. Corcoran	A	17	10	27	Sept. 5		10
Second Lieut.	F. Bouker.	D	17	10	27	May 17		6
Private	A. L. Cort	B	17	10	27	May 16		5
Corporal	F. C. Harriman	K	17	10	27	May 19		5
Q. M. Sergt.	W. M. Ballard	G	17	10	27	May 17		2
Private	C. J. Colles	K	17	10	27	May 19		2
Private	F. B. McGay	B	17	10	27	May 16		2
Private	F. C. Pollard	D	17	10	27	July 4	M. B.	1
Private	E. P. Casey	I	17	10	27	May 19		1
Private	L. T. Thornell	D	17	10	27	Nov. 8	M. B.	
Private	G. J. Ames	F	17	10	27	May 16		
Private	C. S. McKune	G	17	10	27	Sept. 5		
Private	F. M. Bixby, Jr.	I	17	10	27	May 19		
Private	W. A. Denison	I	17	10	27	July 30	M. B.	
Private	C. S. Dodge	K	17	10	27	Oct. 29	M. B.	
Private	F. L. Morrell	K	17	10	27	Nov. 8	M. B.	
Private	G. R. Mosle	K	17	10	27	May 19		
Private	C. P. Geddes	B	17	10	27	Nov. 8	M. B.	
Private	S. A. Harriman	K	18	9	27	May 19		6
Sergeant	F. G. Landon	I	18	9	27	May 19		5
Private	P. M. Mora	F	18	9	27	Nov. 8	M. B.	4
Private	A. M. Tredwell	G	18	9	27	Aug. 27	M. B.	2
Private	A. J. Saalfield	D	18	9	27	May 17		
Private	L. S. Rubira	E	18	9	27	Sept. 5		1
Private	W. C. Adams	I	18	9	27	May 19		1
Private	E. B. Fernald	E	18	9	27	May 17		
Private	C. O. Woodhouse, Jr.	F	18	9	27	May 16		
Private	E. W. Emery	G	18	9	27	Nov. 10		
Private	E. C. McCarter	H	18	9	27	Sept. 5		
Private	A. G. Norrie	K	18	9	27	May 19		
Private	E. S. Blunt	C	18	9	27	May 17		
Private	I. W. Lore	A	19	8	27	May 16		10
Private	L. H. Broome	A	19	8	27	Oct. 15	M. B.	6
Private	G. U. Dixon	G	19	8	27	May 17		4
Private	C. I. Hoeber	I	19	8	27	May 19		3
Private	D. M. Van Vliet	H	19	8	27	July 16	M. B.	3
Private	C. D. Watkins	F	19	8	27	Sept. 5		3
Q. M. Sergt.	H. Everdell	D	19	8	27	Sept. 5		1
Private	G. B. Meneely	E	19	8	27	May 17		
Private	C. H. Cottier	F	19	8	27	Aug. 27	M. B.	
Private	*W. A. French*	A	5	21	26	May 16		12
Private	F. T. Hubball	E	8	18	26	Oct. 29	M. B.	
Private	J. F. Quin	F	8	18	26	Oct. 15	M. B.	
Private	T. J. O'Donohue	G	8	18	26	May 17		
Private	H. S. Raven	K	9	17	26	May 19		1
Private	W. B. Harned	B	11	15	26	Nov. 8	M. B.	1
Private	J. T. Fisher	B	11	15	26	Sept. 5		
Private	F. M. G. Grosz	H	12	14	26	May 19		5
Corporal	E. P. Sperry	F	12	14	26	May 16		4
Private	A. B. Risley	C	12	14	26	May 17		3

SEVENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 Yards.	500 Yards.	Total.			
Private	R. E. Creasey, Jr.	F	12	14	26	Nov. 8	M. B.	2
Private	A. W. Stout	H	12	14	26	May 19		1
Private	C. E. Mitchell	D	12	14	26	Sept. 5		
Private	H. M. Clarke	G	12	14	26	May 17		
Private	T. B. Van Buren, Jr.	K	12	14	26	Aug. 6	M. B.	
Private	C. L. Kohler	D	12	14	26	Sept. 5		
Sergeant	C. M. Baker	B	13	13	26	May 16		7
Private	A. D. Elsworth	I	13	13	26	May 19		4
Corporal	F. R. Lee	C	13	13	26	Aug. 27	M. B.	4
Private	G. Romaine	B	13	13	26	May 16		4
Corporal	H. L. Slade	K	13	13	26	May 19		3
Private	F. E. Triacca	H	13	13	26	May 19		3
Private	E. S. Young	G	13	13	26	May 17		1
Private	H. E. McLewee	C	13	13	26	July 30	M. B.	1
Private	H. H. Hatch	I	13	13	26	Oct. 15	M. B.	1
Private	W. E. F. Smith	E	13	13	26	Sept. 5		
Private	L. J. Lee	B	13	13	26	May 16		
Private	W. J. Phillips	B	13	13	26	May 16		
Q. M. Sergt.	N. M. Beckwith	B	14	12	26	May 16		9
Captain	J. T. Harper	I	14	12	26	May 19		8
Sergeant	R. A. Powers	F	14	12	26	May 16		6
Sergeant	F. L. Van Benschoten	F	14	12	26	May 16		5
Private	S. H. McGill	A	14	12	26	May 16		4
Private	J. L. Beyea	K	14	12	26	May 19		3
Private	J. Baird	B	14	12	26	May 16		2
Private	Y. G. Hall	K	14	12	26	May 19		2
Corporal	J. A. B. Stillings	C	14	12	26	May 17		1
Private	J. M. Thomas	K	14	12	26	Aug. 27	M. B.	1
Private	T. H. Burchell	A	14	12	26	Nov. 8	M. B.	1
Private	T. S. Veitch	D	14	12	26	Oct. 15	M. B.	
Private	S. R. Haxter	E	14	12	26	Nov. 8	M. B.	
Private	W. F. Zittel	E	14	12	26	Nov. 8	M. B.	
Private	L. DeW. Hollub	G	14	12	26	Sept. 5		
Private	J. L. Van Ness	G	14	12	26	Sept. 5		
Private	D. McR. Livingston	K	14	12	26	July 16	M. B.	
Private	W. L. Hazen	B	14	12	26	May 16		
Private	J. E. Disbrow	F	15	11	26	Oct. 29	M. B.	4
Private	W. H. Allen	F	15	11	26	Sept. 5		3
Private	R. W. Elliott	A	15	11	26	Aug. 27	M. B.	3
Private	R. D. Andrews	H	15	11	26	May 19		2
Private	F. G. Du Bois	B	15	11	26	May 28	M. B.	2
Private	A. E. Wood	E	15	11	26	May 28	M. B.	2
Private	P. B. Jennings	F	15	11	26	May 16		1
Private	C. A. J. Queckberner	A	15	11	26	May 16		1
Private	H. M. Orne	I	15	11	26	May 19		1
Private	F. Milliken	B	15	11	29	Oct. 15	M. B.	
Q. M. Sergt.	P. A. Jeannot	A	16	10	26	May 16		5
Private	A. D. Kenyon	B	16	10	26	May 16		3
Corporal	H. G. K. Heath	A	16	10	26	June 11	M. B.	2
Private	M. A. White	B	16	10	26	May 16		2
Corporal	P. D. Handy	I	16	10	26	May 19		1
Private	W. S. Rankin	D	16	10	26	Sept. 5		
Private	T. McLelland	E	16	10	26	Oct. 29	M. B.	
Private	C. L. Poor	F	16	10	26	May 16		
Private	C. L. Jacquelin	G	16	10	26	Nov. 8	M. B.	
Private	I. D. Isham	D	16	10	26	May 17		
Private	C. W. Miller	I	17	9	26	Oct. 29	M. B.	6
Corporal	R. Mazet	H	17	9	26	May 19		5
Private	G. A. Bright	F	17	9	26	May 16		2
Private	J. G. Wentz	I	17	9	26	May 19		2
Private	H. S. Bartow	D	17	9	26	May 17		1
Corporal	T. H. Smyth	D	17	9	26	Aug. 27	M. B.	1
Private	F. W. Tufts	E	17	9	26	May 17		1
Private	A. M. Simpson	E	17	9	26	May 17		1
Private	S. P. Lassell	D	17	9	26	July 16	M. B.	
Private	J. Miller	E	17	9	26	May 17		
Private	H. C. Mabie	G	17	9	26	May 17		
Private	J. D. Sparkman	G	17	9	26	Sept. 5		
Private	D. O. Davenport	H	17	9	26	May 19		
Private	P. Farquhar	K	17	9	26	Aug. 27	M. B.	

SEVENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	F. M. Cornell	A	17	9	26	Sept. 5		
Private	E. Phelan	C	17	9	26	July 4	M. B.	
Private	H. B. Rich	A	18	8	26	Oct. 15	M. B.	3
Private	H. H. Herrick	K	18	8	26	June 11	M. B.	2
Private	E. Fish	H	18	8	26	Oct. 29	M. B.	1
Private	J. J. Alexander	G	18	8	26	May 28	M. B.	
Private	A. F. Woods	G	18	8	26	Aug. 6	M. B.	
Private	G. A. Wylie	G	18	8	26	May 17		
Private	W. H. Sandt	I	18	8	26	Oct. 29	M. B.	
Private	F. U. Paris	K	18	8	26	May 19		
Private	A. S. Gunn	A	18	8	26	May 16		
Private	H. Valentine	I	19	7	26	Oct. 15	M. B.	2
Private	J. Schawel	D	19	7	26	Nov. 8	M. B.	
Private	J. S. Woodhouse	F	19	7	26	May 16		
Private	W. A. Livingston	K	19	7	26	Nov. 8	M. B.	
Private	B. McE. Schmidt	K	19	7	26	Oct. 29	M. B.	
Private	F. P. Wilkinson	E	20	6	26	May 17		5
Private	C. W. Quaife	A	20	6	26	May 16		4
Private	W. A. Harper	I	20	6	26	Oct. 29	M. B.	1
Private	A. Waydell	B	22	4	26	July 16	M. B.	2
Private	DeW. C. Falls	K	23	3	26	Sept. 5		1
Private	F. C. Vecar	G	6	19	25	Sept. 5		1
Private	W. D. Hobart	I	8	17	25	May 19		4
Private	W. S. Wright	E	8	17	25	Nov. 8	M. B.	
Private	F. Blackhurst	A	9	16	25	May 16		1
Private	G. H. DeWitt	F	9	16	25	May 16		
Private	G. C. Parkinson	A	9	16	25	Nov. 8	M. B.	
Private	H. C. Wiltshaw	B	9	16	25	Sept. 15	All comers.	
Private	E. W. Youmans, Jr.	G	10	15	25	Sept. 5		
Private	J. Williams	H	11	14	25	May 19		8
Private	C. H. Jackson	G	11	14	25	July 4	M. B.	2
Private	A. E. Bechstein	E	11	14	25	May 17		
Private	J. F. Kane	E	11	14	25	Oct. 29	M. B.	
Private	C. F. R. Drake	F	11	14	25	May 16		
Private	J. H. Dimond	H	11	14	25	Sept. 5		
Private	R. P. Bliss	I	11	14	25	May 19		
Private	G. T. Van Duzen	A	11	14	25	May 16		
Private	H. Coburn, Jr.	C	11	14	25	May 17		
Private	W. A. Hearn	C	11	14	25	Oct. 15	M. B.	
Private	C. R. Shaw	C	11	14	25	Aug. 27	M. B.	
Q. M. Sergt	G. Gregory	H	12	13	25	Sept. 5		6
Sergeant	G. D. Cook	A	12	13	25	May 16		4
Private	F. O'Byrne	A	12	13	25	Nov. 8	M. B.	4
Private	W. H. Miller, Jr.	E	12	13	25	Nov. 8	M. B.	4
Private	A. C. Jessup	F	12	13	25	Sept. 5		2
Private	W. E. Ward	A	12	13	25	Aug. 27	M. B.	2
Private	F. Vores	E	12	13	25	May 17		1
Private	J. Buck, Jr.	H	12	13	25	May 19		1
Private	J. S. Howell	E	12	13	25	Sept. 5		
Private	I. C. Westlake	E	12	13	25	May 17		
Private	DeW. C. Wheeler, Jr	F	12	13	25	May 16		
Private	C. H. Enders	G	12	13	25	July 16	M. B.	
Private	R. J. Kenworthy	A	12	13	25	Oct. 29	M. B.	
Private	J. F. Simmons	B	12	13	25	Nov. 8	M. B.	
Private	J. Dougherty	D	12	13	25	Sept. 5		
Private	E. L. Nicoll	H	13	12	25	May 19		2
Corporal	A. B. Rich	A	13	12	25	Oct. 15	M. B.	1
Private	R. W. Bonynge	B	13	12	25	Sept. 5		1
Private	O. T. Phillips	C	13	12	25	May 17		
Private	B. S. Peck	E	13	12	25	Nov. 8	M. B.	
Private	A. B. Ely	F	13	12	25	July 16	M. B.	
Private	H. Foot	F	13	12	25	May 16		
Private	J. Frye	I	13	12	25	Sept. 5		
Private	R. S. Minturn	K	13	12	25	May 19		
Private	G. W. Esslinger	B	13	12	25	May 16		
Private	H. B. Welsh	B	13	12	25	Sept. 5		
Private	E. B. Orcutt, Jr	C	13	12	25	July 30	M. B.	
Sergeant	P. D. Braisted, Jr., (S.B.)	N.C.S	14	11	25	May 28	M. B.	6
Sergeant	W. Sprague	C	14	11	25	May 17		6
Private	S. W. Adams	C	14	11	25	May 17		4

SEVENTH REGIMENT — *(Concluded).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	X. Dietlin	C	14	11	25	May 17		4
Private	H. H. Drake	F	14	11	25	Sept. 5		4
Corporal	T. W. Ball	C	14	11	25	May 17		2
Private	H. L. Backus	B	14	11	25	May 16		1
Private	J. D. T. Traill	H	14	11	25	May 19		1
Corporal	F. B. Van Siclen	D	14	11	25	Sept. 5		
Private	E. Valentine	F	14	11	25	Oct. 29	M. B.	
Private	H. P. Fairchild	I	14	11	25	May 19		
Private	F. H. Bidwell	K	14	11	25	Oct. 15	M. B.	
Private	J. T. Wiggins	A	14	11	25	Nov. 8	M. B.	
Corporal	J. F. Theis	C	15	10	25	Sept. 5		7
Private	R. H. Pelton	A	15	10	25	May 16		5
Corporal	A. F. Stone	A	15	10	25	May 16		4
Private	W. J. Gilpin	E	15	10	25	May 17		2
Private	X. Delile	C	15	10	25	May 17		1
Private	F. E. Splain	D	15	10	25	Nov. 8	M. B.	
Private	J. L. McCammon	F	15	10	25	Nov. 8	M. B.	
Private	W. C. Thomas	F	15	10	25	May 16		
Private	E. H. Allen, Jr	I	15	10	25	May 28	M. B.	
Private	R. M. Lyman	I	15	10	25	May 19		
Private	G. L. Varker	I	15	10	25	Oct. 29	M. B.	
Private	T. E. Tripler, Jr	G	15	10	25	Nov. 8	M. B.	
Captain	D. A. Pollard	C	16	9	25	July 16	M. B.	11
First Lieut.	W. C. Fisk	A	16	9	25	Sept. 5		8
Corporal	E. Twyeffort	C	16	9	25	May 17		5
Private	E. L. Young	B	16	9	25	May 16		3
Private	S. W. S. Tennant	D	16	9	25	May 17		2
Private	C. H. Reisig	E	16	9	25	Oct. 15	M. B.	
Private	J. Dowd	I	16	9	25	May 19		
Private	H. Ivison	I	16	9	25	Nov. 8	M. B.	
Private	L. C. Ketchum	I	16	9	25	May 19		
Private	J. W. Harriman	B	16	9	25	Oct. 29	M. B.	
Private	W. W. Price	B	16	9	25	Oct. 29	M. B.	
Private	R. P. Brock	C	16	9	25	Nov. 8	M. B.	
Private	P. Halstead	C	16	9	25	May 17		
Q. M. Sergt.	J. W. Coady	E	17	8	25	Sept. 5		7
Private	G. B. Barcalow	B	17	8	25	Oct. 15	M. B.	5
Private	W. W. Davenport	B	17	8	25	May 16		4
Private	R. S. Hayes	A	17	8	25	July 16	M. B.	4
Private	R. Adams	C	17	8	25	Nov. 8	M. B.	2
Private	J. L. Erving	F	17	8	25	May 16		2
Private	H. V. Keep	I	17	8	25	May 19		2
Private	W. M. Kennard	B	17	8	25	June 11	M. B.	2
Private	L. S. Miller	F	17	8	25	Sept. 5		
Sergeant	E. A. Wolff	G	17	8	25	June 11	M. B.	
Private	H. M. Libby	H	17	8	25	Sept. 5		
Private	H. V. Borden	I	17	8	25	Oct. 29	M. B.	
Private	H. A. Vedder	K	17	8	25	Nov. 8	M. B.	
Private	F. L. Donohue	G	17	8	25	Nov. 10		
Private	J. P. Murray	A	18	7	25	Sept. 5		4
Private	T. T. Pohle	D	18	7	25	May 17		4
Private	I. K. Taylor	I	18	7	25	May 19		4
Private	G. Bragaw	H	18	7	25	May 19		1
Private	P. B. Young	F	18	7	25	May 16		1
Private	J. H. G. Baker	E	18	7	25	Oct. 29	M. B.	
Private	H. W. Banks, Jr.	I	18	7	25	Nov. 8	M. B.	
Private	J. O. Wright	F	19	6	25	Oct. 15	M. B.	8
Private	G. A. Homans	F	19	6	25	Sept. 5		6
Private	C. E. Amerman	F	19	6	25	Aug. 13	M. B.	4
Private	F. B. Wilson	A	19	6	25	May 16		4
Private	W. P. Collins	E	19	6	25	Oct. 29	M. B.	2
Private	J. Halk	B	19	6	25	May 16		2
Corporal	C. O. Touisant	K	19	6	25	May 28	M. B.	2
Private	W. O'Brien	D	19	6	25	Sept. 5		
Private	G. B. Watts, Jr.	K	19	6	25	July 16	M. B.	
Private	J. M. Bolton	D	19	6	25	Sept. 5		
Private	W. S. Parmelee	E	21	4	25	July 4	M. B.	
Corporal	F. W. Janssen	A	23	2	25	Oct. 15	M. B.	2

Total ..... 864.

EIGHTH REGIMENT.

(Figure of merit..... 37.73.)

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Corporal.....	R. B. Simms*.....	C	22	23	45	Sept. 13	N. Y. S. M...	1
Sergeant	W. F. Germain*.....	D	23	21	44	Aug. 2	.....	1
Private	H. Robolle	F	19	22	41	Sept. 13	1st Brigade.	1
Captain.....	W. H. Dewar.....	I	21	16	37	Aug. 2	.....	9
Second Lieut..	K. Neftel.....	E	18	18	36	Nov. 8	C. M. C.....	....
Sergeant	C. Stafford	N.C.S	18	18	36	Aug. 2	.....	11
First Sergt....	J. W. Morgan	B	17	16	33	Aug. 2	.....	8
Captain.....	*Edw. Barker*..... (I. R. P.)	Staff,	19	14	33	May 26	.....	12
Private	C. Johnson.....	I	15	17	32	Aug. 30	.....	....
Q. M. Sergt...	A. M. Milhern.....	C	16	16	32	Aug. 2	.....	3
Sergeant	O. J. Mendel	H	18	14	32	Aug. 2	.....	1
Sergeant	Harry Mosher	B	19	13	32	Aug. 30	.....	....
First Sergt ...	C. Allen	E	16	15	31	May 26	.....	4
Private	Charles Bruhl	H	17	14	31	Aug. 2	.....	....
Captain.....	S. Hemingway, Ast.-Surg.	Staff,	18	13	31	Aug. 30	.....	4
Captain.....	A. A. Oates.....	G	20	11	31	May 26	.....	6
Q. M. Sergt...	Joseph Hearn.....	F	13	17	30	Aug. 2	.....	....
Second Lieut.	Ike Freeman	C	18	12	30	Aug. 30	.....	1
Sergeant	Abr. Jacobson	B	18	12	30	Nov. 8	C. M. C.....	1
Corporal.....	L. Borchers.....	I	18	12	30	Aug. 2	.....	....
Major	H. Chauncy, Jr.....	Field	13	16	29	May 26	.....	2
First Sergt ...	G. H. Smith.....	D	16	13	29	Aug. 2	.....	1
Private	W. B. Price.....	E	16	13	29	Aug. 30	.....	....
Private	J. Clement	E	18	11	29	Aug. 2	.....	....
Private	J. Kellahar.....	I	18	11	29	Aug. 2	.....	....
Sergeant	F. H. Hewlett.....	I	20	9	29	Aug. 2	.....	1
Lieut.-Col	F. A. Schilling	Field	15	13	28	Aug. 8	.....	8
Q. M. Sergt...	E. E. Acker	E	15	13	28	May 26	.....	1
Corporal.....	Wm. Eckenfelder.....	C	16	12	28	Aug. 30	.....	....
Corporal.....	E. Bernard.....	D	16	12	28	Aug. 2	.....	....
Corporal.....	Louis Cammont	E	16	12	28	May 26	.....	1
Private	A. Berley.....	C	17	11	28	Aug. 30	.....	....
Private	G. D. Scott, Jr.....	H	17	11	28	Aug. 30	.....	2
Sergeant	L. Haubennestel	I	19	9	28	Aug. 2	.....	10
Corporal	Wm. Mathews	E	9	18	27	May 26	.....	....
Sergeant	J. W. McGloin	N.C.S	13	14	27	Aug. 30	.....	6
Corporal.....	E. E. Conklin	E	13	14	27	May 26	.....	....
Private	Charles Lang.....	C	14	13	27	Aug. 30	.....	....
Private	T. F. Rutledge.....	D	14	13	27	Aug. 2	.....	1
Second Lieut.	G. C. Heilner.....	D	15	12	27	Aug. 2	.....	....
Q. M. Sergt...	C. A. Ewell.....	B	15	12	27	Aug. 30	.....	1
Sergeant	C. F. Jenkins	C	15	12	27	Aug. 2	.....	....
Private	Joseph Hogan	E	15	12	27	May 26	.....	1
Private	Thomas Handibode.....	I	15	12	27	Aug. 2	.....	....
Corporal.....	M. Tierney.....	B	16	11	27	Aug. 30	.....	....
Private	J. J. Kelly	D	17	10	27	Aug. 2	.....	....
Sergeant	R. B. Breen, Jr.....	N.C.S	18	9	27	Aug. 2	.....	5
Corporal.....	J. J. Collins	D	18	9	27	May 28	.....	....
Sergeant	D. S. Dougherty	N.C.S	19	8	27	Aug. 30	.....	3
Private	William Lyons	G	12	14	26	Aug. 30	.....	1
Corporal.....	W. E. Esterle	B	13	13	26	Aug. 30	.....	....
Private	H. A. Jacobs	D	13	13	26	Aug. 2	.....	....
Private	F. Bickey.....	D	14	12	26	Aug. 30	.....	...
Lieutenant...	G. L. Wentworth (Q. M.)....	Staff	15	11	26	May 26	.....	2
Sergeant	F. Heriman	C	15	11	26	Aug. 2	.....	....
Sergeant	H. C. Freeman.....	D	15	11	26	May 26	.....	....
Private	H. Greegs.....	B	15	11	26	Aug. 30	.....	....
Private	E. A. Meyer	E	15	11	26	Aug. 30	.....	....
Corporal.....	Chas. Woodman	D	16	10	26	Aug. 2	.....	....
Private	P. W. Memecke.....	D	16	10	26	Aug. 2	.....	....
Private	E. E. Traphagen.....	E	16	10	26	Aug. 30	.....	....
Captain.....	E. A. Oothout	E	17	9	26	May 26	.....	2
Sergeant	*T. R. Murphy*.....	N.C.S	17	9	26	May 26	.....	12
Private	E. E. Englehardt	B	17	9	26	Aug. 30	.....	....
Private	Jas. Thompson.....	I	17	9	26	Aug. 30	.....	....
Private	L. Loeffel	D	18	8	26	Aug. 2	.....	....
Private	J. J. Fullan.....	I	18	8	26	Aug. 2	.....	....

EIGHTH REGIMENT — *(Concluded).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Colonel	*G. D. Scott*	Field	19	7	26	Aug. 30		12
Private	W. T. Murphy	B	19	7	26	Aug. 2		3
Private	W. M. Curran	E	10	15	25	May 26		
Second Lieut.	G. P. Cammann	I	11	14	25	May 26		1
Private	W. Fisher	I	13	12	25	Aug. 30		2
Private	J. F. Shannard	C	13	12	25	Aug. 30		2
Private	C. A. Van Varach	D	14	11	25	Aug. 30		
Private	E. J. Mathews	E	14	11	25	Aug. 2		
Sergeant	J. W. Buckman	D	15	10	25	Aug. 2		
Sergeant	G. F. Kemp	I	15	10	25	Aug. 30		
Private	E. J. McCauley	C	15	10	25	Aug. 30		
Private	Chas. Morton	C	15	10	25	Aug. 2		
Private	P. Gannon	E	15	10	25	Aug. 30		
First Lieut	W. de L. Cunningham	I	16	9	25	Nov. 8	C. M. C.	1
Sergeant	D. Corbitt	N.C.S	16	9	25	Aug. 2		5
Private	F. Meyers	C	16	9	25	May 26		
Private	W. J. Tucker	C	16	9	25	Aug. 30		1
Private	G. A. Bruce	G	16	9	25	May 26		
Private	F. Hirsch	I	16	9	25	Aug. 2		
Private	W. H. Miller	E	17	8	25	Aug. 2		1
Private	Jas. McCready	G	17	8	25	Aug. 30		1
Private	*M. P. Ross*	G	17	8	25	May 26		12
Private	Jos. Tiernan	I	17	8	25	Aug. 2		
Private	Edw. Hart	I	18	7	25	Aug. 30		
First Sergt.	T. P. Mackenna	G	19	6	25	May 26		4

Total 92

NINTH REGIMENT.

(Figure of merit..... 37.53.)

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Sergeant	J. M. Maconnell*	H	22	22	44	Oct. 15	C. M. C.	
Q. M. Sergt	F. J. Higgins*	N.C.S	22	20	42	Oct. '27		2
Private	*N. D. Ward*	A	19	22	41	July 16	C. M. C.	12
Captain	T. H. Swift	D	20	20	40	June 7		4
First Lieut	F. Bartlett	E	20	17	37	Oct. 29	C. M. C.	3
First Lieut	Y. D. Dechert (Adj.)	Staff	14	22	36	June 6		4
Major	C. A. H. Bartlett	Field	17	19	36	June 6		6
Private	J. W. Demler	E	17	19	36	Oct. 29	C. M. C.	4
Private	M. J. Ruttle	G	19	17	36	Aug. 27	C. M. C.	2
Private	J. C. Potthoff	B	20	16	36	Oct. 29	C. M. C.	2
Ord. Sergt.	Wm. Seward, 3d	N.C.S	21	15	36	May 28	C. M. C.	2
Private	G. M. Roeser	H	15	20	35	Oct. 29	C. M. C.	
Captain	W. R. Clough	H	17	18	35	Aug. 7	C. M. C.	2
First Sergt	W. F. Schultz	E	17	18	35	Oct. 12		
Private	A. Ebling	H	17	18	35	Oct. 29	C. M. C.	
Corporal	J. H. Ford	H	18	17	35	June 6		2
Corporal	Joseph O. Brady	F	19	16	35	June 6		4
Private	A. S. Norman	B	20	15	35	June 6		3
Private	N. Wenz, Jr.	H	17	17	34	Nov. 8	C. M. C.	
Lieut.-Col	T. B. Rand	F	16	17	33	Oct. 15	C. M. C.	5
Private	W. J. Sullivan	B	16	17	33	June 6		
Sergeant	E. L. Chase	K	17	16	33	Nov. 8	C. M. C.	
Private	E. Howard	G	17	16	33	Nov. 8	C. M. C.	
Captain	H. W Leonard	I	20	13	33	Oct. 12		1

NINTH REGIMENT *(Continued)*.

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Corporal	J. J. Kellock	H	13	19	32	June 6		3
Private	J. F. Mahoney	H	13	19	32	June 6		
Corporal	W. J. Dillon	E	14	18	32	Nov. 8	C. M. C.	2
Second Lieut.	W. Willcocks	G	16	16	32	June 18	C. M. C.	3
First Lieut	*C. E. Kohlberger*	I	19	13	32	June 6		12
Private	H. Slurff	D	20	12	32	June 6		5
Private	*A. L. Donegan*	A	13	18	31	Oct. 92	C. M. C.	12
Sergeant	H. C. Yager (Hos. Stewart)	N.C.S	17	14	31	June 6		2
Private	H. N. Egly	I	17	14	31	Oct. 12		
Captain	G. T. Lorigan	A	18	13	31	June 6		8
First Sergt	John Genzel	C	14	16	30	Oct. 12		4
Captain	K. C. Gibson (I. R. P.)	Staff	16	14	30	July 16	C. M. C.	1
Private	Max Lehmen	H	16	14	30	Oct. 12		4
Private	J. J. Strong	G	16	14	30	Oct. 12		1
Sergeant	Chas. Moser	H	18	12	30	June 6		2
Private	G. W. Klune	H	19	11	30	Oct. 1	C. M. C.	
Sergeant	Chas. Herse	E	20	10	30	June 6		5
Private	C. Arbano	I	23	7	30	Nov. 10		
Q. M. Sergt.	C. W. Scherhring	D	14	15	29	June 6		
Sergeant	Geo. Griger, Jr.	I	14	15	29	June 6		1
Private	T. E. Willcocks	G	14	15	29	Oct. 12		2
Sergeant	J. N. Hill (C. B.)	N.C.S	15	14	29	June 6		1
Corporal	Chas. Schmeiser	B	15	14	29	June 6		6
Private	J. T. Betts	H	16	13	29	Oct. 12		
Corporal	A. Willcocks	G	18	11	29	June 8	C. M. C.	
Corporal	V. Corner	F	20	9	29	June 6		4
Private	T. Supple	H	12	16	28	Nov. 8	C. M. C.	
Sergeant	W. J. Austin, C. B.	N.C.S	13	15	28	June 6		5
Captain	A. H. Doty, (Asst. Surg.)	Staff.	14	14	28	June 6		4
Corporal	D. Callahan	F	14	14	28	Oct. 12		
Private	J. Bishop	I	15	13	28	Oct. 12		
Corporal	H. Bullwinkle	I	16	12	28	June 6		2
Major	H. W. Roof, (Surgeon)	Staff.	17	11	28	Oct. 15	C. M. C.	9
First Lieut	D. B. Pratt, (Q. M.)	Staff.	17	11	28	June 6		1
Second Lieut.	J. D. Walton	D	17	11	28	Oct. 12		3
Private	C. E. Crawford	C	17	11	28	June 6		
Private	C. H. Goetzinger	B	18	10	28	June 6		
Private	W. H. Herbold	B	19	9	28	Oct. 15	C. M. C.	2
Private	James Kidney	B	19	9	28	June 6		
Private	F. Chase	K	19	9	28	June 6		
Q. M. Sergt.	E. W. Watkins	B	22	6	28	June 6		7
Sergeant	J. A. Conners	G	10	17	27	Oct. 12		1
First Sergt.	H. A. Harris	A	11	16	27	Aug. 13	C. M. C.	1
Second Lieut.	W. H. Ehrman	F	12	15	27	June 6		4
Corporal	H. Deves	H	12	15	27	June 6		2
Private	W. Taylor	F	13	14	27	Oct. 12		1
Private	P. F. McCorney	G	14	13	27	June 18	C. M. C.	1
Private	W. H. Truman	H	14	13	27	Oct. 29	C. M. C.	
Corporal	W. J. Guineran	D	15	12	27	June 6		1
Private	John Hay	F	15	12	27	Oct. 12		1
Private	W. E. Monroe	H	15	12	27	Oct. 12		
Sergt. Major.	W. H. Van Vleck	M. S.	16	11	27	June 6		3
Q. M. Sergt.	John Maguire	F	17	10	27	Oct. 12		2
Private	W. F. Holderman	I	17	10	27	Oct. 12		
Private	F. Moran	I	17	10	27	Nov. 8	C. M. C.	
Corporal	John Murray	I	17	10	27	June 6		1
Corporal	A. J. Avons	F	18	9	27	June 6		
Captain	S. E. Japha	E	20	7	27	June 6		9
Private	George Leibrock	D	11	15	26	June 6		1
Corporal	E. J. Winterroth	K	11	15	26	June 11	C. M. C.	1
First Lieut	F. A. Gale	H	13	13	26	June 6		1
First Sergt.	W. F. Higgins	I	13	13	26	June 6		
Private	T. M. Hamilton	H	13	13	26	June 6		1
Private	F. Petzold	I	13	13	26	June 6		1
Private	C. E. Weinman	K	13	13	26	Nov. 10		
Captain	W. W. Marks	F	14	12	26	June 6		1
Corporal	Charles Wilkinson	F	14	12	26	Oct. 12		1
First Lieut	F. S. Rice	G	15	11	26	June 6		5
First Lieut	J. N. Billings	K	15	11	26	June 6		
Sergeant	W. A. D. Holmes	F	15	11	26	June 6		1

NINTH REGIMENT — *(Concluded.)*

RANK.	Name.	Company.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	F. E. Sylvester	F	15	11	26	June 6		
Private	W. Gottschalk	E	16	10	26	Nov. 10		
Private	Charles Maire	D	17	9	26	Oct. 12		1
Private	J. Lawrence	I	17	9	26	Oct. 12		
First Sergt	C. M. Gilbert	D	19	7	26	Nov. 8	C. M. C.	3
Corporal	G. W. Ward	I	19	7	26	Oct. 12		7
Private	E. W. Webbon	B	19	7	26	June 6		2
Private	G. Brueninger	F	19	7	26	Oct. 12		
Private	E. F. Clark	H	19	7	26	June 6		3
First Sergt	R. F. Morris	H	9	16	25	Nov. 8	C. M. C.	1
Sergeant	G. J. Weidman (Com. S'gt)	N.C.S	10	15	25	Nov. 8	C. M. C.	2
Private	D. Lagomaisino	I	11	15	26	June 6		
Private	W. H. Dusenbury	C	12	13	25	Oct. 12		
Private	P. Connelly	B	13	12	25	June 6		1
Captain	G. Henry Witthaus	Staff	14	11	25	June 6		9
Private	M. J. Browne	F	14	11	25	June 7		
Private	C. J. Schultz	H	14	11	25	Nov. 8	C. M. C.	
Private	L. Paganette	I	14	11	25	June 6		
Private	H. Holebeck	K	14	11	25	Oct. 12		1
Private	J. A. McGinn	K	14	11	25	Sept. 17	C. M. C.	4
Colonel	Wm. Seward	Field	15	10	25	June 6		10
Private	J. H. Wagler	C	15	10	25	Oct. 12		
Private	E. Flubacker	I	15	10	25	Oct. 12		
Sergeant	W. E. Bryde	F	16	9	25	June 6		3
Sergeant	J. M. Brandon	A	17	8	25	Oct. 21		2
Private	A. Vachries	C	17	8	25	Nov. 8	C. M. C.	1
Private	D. F. Buckley	H	17	8	25	Oct. 12		1
Private	P. G. Jefferys	H	17	8	25	June 6		1
Private	J. H. Lange	I	18	7	25	Nov. 8	C. M. C.	
Sergeant	F. H. Hoyt	A	19	6	25	Oct. 12		4

Total ..... 124.

ELEVENTH REGIMENT.

(Figure of merit ..... 32.68.)

RANK.	Name.	Company.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Captain	J. W. Hale* (I. R. P.)	Staff	23	22	45	Sept. 15	C. M. C.	1
Q. M. Sergt	Chris. Havermeier	A	19	17	36	Sept. 2		
First Sergt	Geo. Fleischmann	F	15	20	35	June 13		
First Lieut	A. Christinsen	K	18	17	35	Sept. 2		1
Private	Charles Schroaeder	G	18	17	35	Sept. 2		
Captain	B. Ranft	H	19	16	35	Sept. 2		3
Captain	F. F. Schmidt	C	16	18	34	June 13		4
Private	I. Silver	A	16	17	33	Sept. 2		
Sergeant	M. Kramer	C	15	16	31	June 13		1
Private	F. Boemer	C	15	16	31	Sept. 2		
Corporal	W. Ritter	G	16	15	31	Sept. 2		
Private	E. Harris	G	16	15	31	Sept. 2		1
Q. M. Sergt	E. von Zingen	G	20	11	31	June 13		
First Sergt	L. Kost	G	11	19	30	Sept. 2		
Major	F. A. Jones	Field	12	18	30	Nov. 8	C. M. C.	1
Captain	F. Albrecht	A	13	17	30	June 13		2
Private	H. Le Mond	A	13	17	30	Sept. 2		
Private	F. Farnnalto	G	13	17	30	Sept. 2		
Second Lieut	W. L. Miller	D	15	15	30	June 13		
Private	Paul Zahn	F	15	15	30	Sept. 2		

ELEVENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	George Thom	K	15	15	30	Sept. 2		
First Sergt	F. C. Robbins	B	18	12	30	June 13		
Sergeant	Chas. Gress	A	18	12	30	June 13		1
Private	M. Nathan	K	19	11	30	Sept. 2		
Private	Wm. Maguire	I	13	16	29	June 13		
Corporal	E. Numerich	C	15	14	29	Sept. 2		
Private	L. Orth	C	15	14	29	Sept. 2		
Private	M. McNulta	A	16	13	29	Sept. 2		
Private	Geo. Mohr	C	17	12	29	Sept. 2		
Private	F. Heisler	G	18	11	29	Sept. 2		
Private	D. Pueschman	H	20	9	29	June 13		
Private	D. W. Wilcox	F	12	16	28	Sept. 2		1
Private	F. Alexandel	A	13	15	28	June 13		
Ord. Sergt	John Burgert	N.C.S	15	13	28	Sept. 2		3
Private	B. Hahn	A	15	13	28	Sept. 2		
Private	G. Rynne	A	15	13	28	Sept. 2		
Private	John Stuart	A	15	13	28	June 13		
Private	Jas. Ferrier	A	16	12	28	Sept. 2		
Sergeant	J. Stern	D	17	11	28	Sept. 2		
Colonel	A. P. Stewart	Field	19	9	28	June 13		1
Second Lieut.	A. E. Seliger	G	20	8	28	June 30	C. M. C.	
Private	R. Rimmer	C	12	15	27	June 13		1
Private	M. Heldebrand	A	13	14	27	Sept. 2		
Private	C. Orth	C	13	14	27	Nov. 8	C. M. C.	
Private	J. A. Frank	F	14	13	27	Sept. 2		
Second Lieut.	L. Gumbert	F	15	12	27	June 13		
Corporal	H. Hentschel	A	15	12	27	June 13		
Private	F. Funk	A	15	12	27	Sept. 2		
Private	A. Freedman	A	15	12	27	Sept. 2		
Private	Leo. Riger	A	15	12	27	Sept. 2		
Private	E. D. Scott	A	15	12	27	Sept. 2		
Private	R. Mendleson	D	15	12	27	Sept. 2		
Corporal	H. Eberle	D	16	11	27	Sept. 2		
Private	J. Kuntz	A	16	11	27	Sept. 2		
Private	L. Harris	G	16	11	27	Sept. 2		
First Lieut	R. A. Denahan	F	17	10	27	June 13		
Private	P. Briger	F	19	8	27	Sept. 2		
Captain	G. W. Collins (Asst. Surg.)	Staff	10	16	26	June 13		1
Private	A. Falk	A	11	15	26	June 13		
Private	C. Krumpel	C	12	14	26	Nov. 8	C. M. C.	
Major	W. Goetz (Surgeon)	Staff	13	13	26	June 13		1
Second Lieut.	G. Fleischer	H	13	13	26	Sept. 2		1
Private	H. Valdenburg	F	13	13	26	Sept. 2		
Private	J. Imholz	F	14	12	26	Sept. 2		
Private	F. Medenbach	H	14	12	26	June 13		
Private	John Kommann	K	14	12	26	Sept. 2		
First Lieut	Jos. Obermeyer	C	15	11	26	June 13		1
Private	Jac. Aberle	A	15	11	26	Sept. 2		
Private	Dav. Davis	A	15	11	26	Sept. 2		
Private	A. Benedig	C	15	11	26	Sept. 2		
Private	E. Shunghelm	G	15	11	26	Sept. 2		
Private	A. Aberle	K	15	11	26	Sept. 2		1
Corporal	George Herans	D	16	10	26	Sept. 2		
Private	C. Buddenhagen	A	16	10	26	Sept. 2		
Private	C. Callahan	A	16	10	26	Sept. 2		
Private	P. Bedlingmeier	C	16	10	26	Sept. 2		
Private	J. E. Seibert	C	16	10	26	Sept. 2		
Corporal	T. Harberle	D	16	10	26	Sept. 2		
Private	H. Kahn	D	16	10	26	Sept. 2		
Private	L. Ebler	G	16	10	26	Sept. 2		
Corporal	George Gress	A	18	8	26	Sept. 2		1
Corporal	Charles Cook	A	19	7	26	June 13		
Private	H. Henke	C	9	16	25	Nov. 8	C. M. C.	
Corporal	E. Hermes	C	10	15	25	June 13		
Private	A. Rothpletz	F	10	15	25	Sept. 2		
Private	G. Balkner	H	10	15	25	Sept. 2		
Private	R. Lottie	C	12	13	25	Sept. 2		
Private	B. Harschowitz	D	13	12	25	Sept. 2		
Sergeant	H. L. Goldberg	D	14	11	25	Sept. 2		1
Corporal	C. Lunig	F	14	11	25	Sept. 2		

ELEVENTH REGIMENT — (*Concluded*).

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	M. Arnkeim	A	14	11	25	June 13		
First Lieut	C. H. Collins	H	15	10	25	June 13		
Corporal	D. Madison	K	15	10	25	Sept. 2		
Private	J. Ammon	B	15	10	25	Sept. 2		
Private	William Schmidt	I	15	10	25	June 13		
Captain	Charles F. Surburg	I	16	9	25	June 13		2
First Sergt	L. Bernet	C	16	9	25	June 13		1
Private	G. Gardella	C	16	9	25	Sept. 2		
Private	F. von Wenning	G	16	9	25	Sept. 2		
Private	John Simoner	K	16	9	25	Sept. 2		
First Lieut	G. W. Mooney	B	17	8	25	June 13		
Sergeant	P. Burkhard	A	17	8	25	June 13		
Sergeant	O. Kuehl	D	17	8	25	Sept. 2		
Private	L. Solomon	A	17	8	25	Sept. 2		
Lieutenant	F. Yung (Q. M.)	Staff	18	7	25	June 13		
Private	John Nau	B	18	7	25	Sept. 2		

Total.....106

TWELFTH REGIMENT.

(Figure of merit..... 45.22.)

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Ord. Sergt	*T. J. Dolan**	N.C.S	24	24	48	Oct. 29	C. M. C	12
Captain	Washington Content*	H	23	23	46	Aug. 5		5
Sergeant	Tim Mahoney*	E	21	24	45	May 28	C. M. C	5
Sergeant	William Lawson*	B	22	23	45	July 4	C. M. C	2
Private	H. T. Farrell*	B	24	21	45	Sept. 13	C. M. C	6
Sergeant	*A. B. Van Heusen**	B	19	25	44	Sept. 14	C. M. C	12
Corporal	H. E. Hehen*	I	20	24	44	Aug. 1		1
First Sergt	Thomas Kelly*	H	22	22	44	Aug. 5		10
Private	Enoch Lockley*	E	19	24	43	July 4	C. M. C	2
First Lieut	McC. Butt*	D	20	23	43	Oct. 15	C. M. C	6
Colonel	James H. Jones*	Field	21	22	43	Aug. 5		8
Second Lieut.	A. E. Schuman*	G	21	22	43	Aug. 1		1
Sergeant	J. H. Cockburn*	A	22	21	43	Oct. 29	C. M. C	2
First Sergt	W. L. Frost*	C	19	23	42	Aug. 5		2
Private	M. E. Stewart*	G	19	23	42	Aug. 1		
Captain	H. C. Aspinwall*	I	20	22	42	Aug. 5		9
Private	J. L. Jennings*	I	21	21	42	Aug. 1		3
Sergeant	T. C. Rose*	D	22	20	42	Oct. 3		
Corporal	James Simpson	B	21	19	40	July 30	C. M. C	2
Major	N. H. Henry, (Surg.)	Staff.	17	22	39	June 18	C. M. C	4
Captain	John Macaulay	E	20	19	39	Aug. 5		7
Sergeant	John McDermott	E	17	21	38	July 4	C. M. C	3
Captain	Howland Pell	A	19	19	38	Oct. 13		6
Corporal	J. J. O'Neil	A	19	19	38	Aug. 1		1
Private	F. Lopez	I	20	18	38	Aug. 1		1
Sergeant	J. D. Mueller (L. G. G.)	N.C.S	15	22	37	Aug. 5		2
Captain	C. L. Lindley (Asst. Surg.)	Staff.	16	21	37	Oct. 13		1
Captain	B. S. Barnard	D	19	18	37	Aug. 1		6
First Sergt	G. D. Gallard	F	20	17	37	Aug. 5		10
Corporal	George Frothingham	H	16	20	36	Aug. 5		
Private	F. Miller	H	17	19	36	Aug. 5		2
Sergeant	C. W. Harris	D	18	18	36	Aug. 1		2
Corporal	B. Reilly	E	19	17	36	Aug. 5		3

TWELFTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	John Casey	E	19	17	36	Aug. 5		3
Sergeant	L. Jackson	D	22	14	36	July 4	C. M. C.	2
Second Lieut.	F. F. Carey	I	16	19	35	Aug. 1		2
Private	S. Barrenger	C	15	19	34	Aug. 5		
Private	J. F. White	K	15	19	34	Oct. 13		1
Private	Robert Paul	D	16	18	34	Oct. 13		1
Lieutenant	A. F. Schermerhorn (Adjt.)	Staff.	18	16	34	Aug. 1		8
Private	M. O'Brien	E	18	16	34	Aug. 5		1
First Sergt	R. C. Kammerer	K	19	15	34	Aug. 1		7
Private	A. A. White	B	18	15	34	Aug. 5		1
Lieut.-Col	Heman Dowd	F	15	18	33	Aug. 5		2
Corporal	J. R. Foran	D	16	17	33	Aug. 1		2
Sergeant	H. Lawson	B	17	16	33	Aug. 5		3
Private	A. Lawrence	C	18	15	33	Aug. 5		1
Lieutenant	J. A. Haskell (Com.)	Staff.	19	14	33	Aug. 5		2
Sergeant	E. L. Usbeck	K	13	19	32	Aug. 1		5
Private	James Warshauer	A	13	19	32	Aug. 1		
Private	L. M. Kinney	B	13	19	32	Aug. 5		
Captain	C. S. Burns	B	18	14	32	Aug. 5		10
First Lieut.	F. Roosevelt	E	18	14	32	Aug. 5		1
Sergeant	C. N. Bajart (Col. B.)	N.C.S	18	14	32	Aug. 1		5
Private	E. Eberhart	F	19	13	32	Aug. 5		1
Sergeant	Wm. Kilpatrick	I	20	12	32	Aug. 1		
Private	F. W. Brown	K	20	12	32	Oct. 13		
Private	F. Bodinstine	D	14	17	31	Aug. 1		
Private	R. Sale	B	15	16	31	Aug. 5		
First Sergt.	Wm. Warren	A	18	13	31	Aug. 1		3
First Lieut.	J. W. Gerard, Jr.	F	13	17	30	Oct. 13		1
Private	Thos. McCaffery	H	14	16	30	Aug. 5		
Major	John J. Riker	Field	15	15	30	Oct. 13		5
Corporal	W. B. Park	D	15	15	30	Aug. 1		
Sergeant	W. Gribble	B	16	14	30	Aug. 5		1
Private	A. A. Brewer	B	17	13	30	Aug. 5		8
Captain	W. H. Kirby	G	18	12	30	Aug. 1		11
Captain	*W. H. Murphy*	F	20	10	30	Aug. 5		12
Sergeant	C. J. Dentinger	F	11	18	29	Aug. 5		2
First Lieut.	E. C. Smith	A	12	17	29	Aug. 1		5
Private	J. F. Drake	C	13	16	29	Aug. 5		
Captain	J. F. Boylan	K	14	15	29	Aug. 1		1
Private	W. W. Castor	D	14	15	29	Oct. 13		1
Private	W. J. Fitzpatrick	E	14	15	29	Oct. 13		2
Private	M. Mulligan	G	14	15	29	Oct. 13		1
Private	L. K. Young	D	15	14	29	Oct. 13		
Private	J. Heibison	F	15	14	29	Aug. 5		1
Private	M. Castellanos	H	15	14	29	Aug. 5		
Captain	J. M. Brady (J. B.)	Staff.	16	13	29	Aug. 5		2
Q. M. Sergt.	G. W. Homans	N.C.S	16	13	29	Aug. 1		2
Private	M. Bulger	H	16	13	29	Aug. 5		
Private	J. R. Jenkins	H	17	12	29	Aug. 5		1
Corporal	E. U. Rice	D	18	11	29	Aug. 1		2
Private	F. E. Fairman	D	18	11	29	Oct. 13		
Private	Jos. Wright	D	18	11	29	Oct. 13		
Private	F. O'Donnell	F	18	11	29	Aug. 5		1
Sergeant	H. Kessler	H	19	10	29	Aug. 5		
Corporal	John Winstock	E	19	10	29	Aug. 5		2
Corporal	J. F. Dooley	A	20	9	29	Aug. 1		
Private	W. T. Grundmain	B	12	16	28	Aug. 5		
Private	S. L. Kapff	D	12	16	28	Aug. 1		
Private	E. J. King	A	13	15	28	Aug. 1		1
Second Lieut.	L. G. Brigg	K	14	14	28	Oct. 13		3
Sergeant	A. L. Huyler (Hos. Stew.)	N.C.S	14	14	28	Aug. 5		1
Private	R. H. Coleman	H	14	14	28	Aug. 5		4
Private	J. J. McMahon	H	14	14	28	Aug. 5		
Private	J. H. Noziglia	B	15	13	28	Aug. 5		1
Corporal	Sam Frank	K	16	12	28	Oct. 13		
Private	S. H. Ganter	D	16	12	28	Aug. 1		
Private	H. W. McCauley	D	17	11	28	Aug. 5		
Private	W. W. Fonlis	D	17	11	28	Aug. 1		
First Lieut.	Sam. Parsons	H	18	10	28	Oct. 13		6
Sergeant	J. J. Wennenberg	F	18	10	28	Aug. 5		1

TWELFTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Corporal	D. S. Graham	F	18	10	28	Aug. 5		1
Private	A. J. Wenk	A	18	10	28	Oct. 13		
Private	N. Pontius	H	18	10	28	Aug. 5		2
Sergeant	W. Cropsey	G	19	9	28	Aug. 1		2
Private	W. P. Catlin	D	20	8	28	Oct. 13		1
Corporal	M. Malone	E	11	16	27	Aug. 5		3
Private	Thomas Watts	D	12	15	27	Aug. 1		
Com. Sergt.	A. Rippenger	N.C.S	13	14	27	Aug. 1		3
Private	F. J. Speidel	D	13	14	27	Aug. 5		
Private	John Wright	H	13	14	27	Aug. 5		
Corporal	D. Symes	I	14	13	27	Aug. 1		
Private	J. H. Snyder	D	14	13	27	Aug. 1		
Private	Jas. Quigley	H	14	13	27	Aug. 5		
First Sergt.	C. J. Farrell	I	15	12	27	Aug. 1		2
Corporal	M. Couch	I	15	12	27	Aug. 1		1
Private	Jas. Mazza	A	15	12	27	Aug. 1		1
Private	H. A. Green	C	15	12	27	Aug. 5		
Private	Jas. Farrell	E	15	12	27	Oct. 13		1
Private	L. A. Lallemont	H	15	12	27	Aug. 5		
Private	D. C. Sherwood	B	16	11	27	Aug. 5		
Private	J. M. Mayorga	D	16	11	27	Aug. 1		
Private	H. D. Schade	D	16	11	27	Oct. 13		
Private	J. A. Toumey	D	16	11	27	Aug. 1		
Corporal	J. A. Dardis	H	16	11	27	Aug. 5		
Private	J. H. Summerhayes	H	16	11	27	Oct. 13		
Second Lieut.	H. G. Paine	E	17	10	27	Aug. 13	C. M. C.	
Sergeant	A. Mitchell	H	17	10	27	Aug. 5		2
Corporal	William Armstrong	D	17	10	27	Aug. 1		
Corporal	Charles Goebel	D	17	10	27	Aug. 1		2
Private	J. B. Simpson	C	17	10	27	Aug. 5		
Private	W. Henderson, Jr.	G	17	10	27	Oct. 13		
Private	C. E. Gleason	H	18	9	27	Aug. 5		
Corporal	D. R. Ireland	C	20	7	27	Aug. 5		2
Private	T. H. Sunderland	I	22	5	27	Aug. 1		2
Private	C. L. Hyde	D	8	18	26	Aug. 1		
Sergeant	T. C. Patterson	C	11	15	26	Aug. 5		1
Lieutenant	E. R. Powers (Q. M.)	Staff	12	14	26	Aug. 1		1
Private	A. B. Dunsmore	K	12	14	26	Aug. 1		
Sergeant	J. M. Campbell	K	13	13	26	Oct. 13		1
Private	E. Willcocks	B	13	13	26	Oct. 13		1
Private	G. M. Fetzer	D	13	13	26	Aug. 1		2
Private	G. R. Reid	H	13	13	26	Aug. 5		1
Corporal	H. Freund	H	14	12	26	Aug. 5		
Private	C. W. Halleck	D	14	12	26	Oct. 13		
Private	R. L. Humphreys	I	14	12	26	Aug. 1		
Q. M. Sergt.	C. W. Pratt	D	15	11	26	Oct. 13		
Corporal	F. Dannic	F	15	11	26	Aug. 5		2
Private	W. H. Traphagen	D	15	11	26	Oct. 13		
Private	H. Brown	H	15	11	26	Oct. 13		
Private	J. Deenan	H	15	11	26	Aug. 5		
Private	T. F. Day	I	15	11	26	Oct. 13		
Second Lieut.	E. L. Knoedler	H	16	10	26	Aug. 5		1
Q. M. Sergt.	J. E. Crawford	H	16	10	26	Oct. 13		1
Private	J. Reegan	C	16	10	26	Aug. 5		
Private	F. S. Partridge	H	16	10	26	Oct. 13		
Sergeant	John Hoag	I	17	9	26	Aug. 1		3
Corporal	L. Schubach	H	17	9	26	Oct. 13		
Private	J. H. Wesel	D	17	9	26	Oct. 13		
Private	W. G. Brown	G	17	9	26	Aug. 1		
Private	F. A. Ernest	H	18	8	26	Aug. 5		
Private	Geo. Christian	A	19	7	26	Aug. 1		2
Private	G. Brisheim	C	19	7	26	Aug. 5		1
Private	F. E. Loughlin	D	19	7	26	Aug. 1		1
Private	Thos. Wright	D	19	7	26	Oct. 13		
Private	J. Bernert, Jr	K	19	7	26	Aug. 1		1
Private	D. H. Melville	B	10	16	26	Aug. 5		
Private	L. Van Huesen	F	10	15	25	Aug. 5		
Private	J. J. Cosgrove	I	10	15	25	Aug. 1		
Private	H. Cummings	E	11	14	25	Aug. 5		
Private	M. Brown	K	11	14	25	Aug. 1		

TWELFTH REGIMENT — *(Concluded).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	J. J. D'Arcy	B	12	13	25	Oct. 18		1
Private	H. Henry	G	12	13	25	Aug. 1		
Private	J. T. Vizi	G	12	13	25	Aug. 1		
Private	Wm. Walker	H	12	13	25	Aug. 5		1
Private	W. H. Harderson	D	12	13	25	Oct. 13		
Private	John Graff, Jr	G	13	12	25	Aug. 1		2
Sergeant	D. I. Thompson	D	14	11	25	Aug. 5		2
Private	J. Johnston, Jr	A	14	11	25	Oct. 13		
Private	J. Sternberger	A	14	11	25	Nov. 8	C. M. C.	2
Private	G. Vantaser	D	14	11	25	Oct. 13		
Private	A. Knox	I	14	11	25	Aug. 1		
Private	W. H. Orr	I	14	11	25	Aug. 1		
Corporal	Geo. Erfort	B	15	10	25	Aug. 5		7
Private	E. Cudlipp	I	15	10	25	Aug. 1		
Private	F. M. Tyson	B	16	9	25	Aug. 5		1
Private	E. T. Starr	D	16	9	25	Aug. 1		2
Private	S. C. Smith	D	16	9	25	Oct. 13		
Private	C. T. Jewell	C	17	8	25	Aug. 5		
Private	C. Montague	D	17	8	25	Oct. 13		1
Private	W. Darragh	F	17	8	25	Aug. 5		
Private	J. W. Berry, Jr	K	17	8	25	Aug. 27	C. M. C.	
Private	G. B. Metz	B	17	8	25	Aug. 5		1
Private	W. P. Pulis	B	18	7	25	Aug. 5		
Private	D. F. Killen	F	20	5	25	Aug. 5		1

Total 197

TWENTY-SECOND REGIMENT.

(Figure of merit ..... 46.79.)

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 Yards.	500 Yards.	Total.			
Captain	N. B. Thurston*	E	22	24	46	Aug. 27	C. M. C.	10
First Lieut.	J. R. Byrd*	F	22	24	46	Nov. 8	C. M. C.	5
Q. M. Sergt.	O. W. Vatet*	F	22	23	45	Aug. 27	C. M. C.	
Private	C. L. Levien*	G	22	23	45	July 4	C. M. C.	2
Sergeant	M. E. Burnton*	F	20	24	44	Oct. 29	C. M. C.	11
Private	E. Rudolphy, Jr.*	E	21	23	44	June 11	C. M. C.	3
Second Lieut.	W. N. Bavier*	B	18	24	42	Sept. 14	C. M. C.	10
Sergeant	J. A. Turney	F	21	19	40	June 11	C. M. C.	5
Private	J. J. Sullivan	B	19	19	38	Aug. 27	C. M. C.	6
Second Lieut.	R. J. Daly	K	15	22	37	Nov. 8	C. M. C.	4
First Lieut.	Jas. O'Neill	D	17	20	37	June 17		5
First Lieut.	W. B. Smith, (Adjt.)	Staff	18	19	37	June 17		3
First Sergt.	M. C. Murray	C	18	18	36	June 17		2
Private	T. Davids	H	20	16	36	June 17		
Corporal	C. F. Kross	B	16	19	35	June 17		1
Private	W. H. Lux	F	16	19	35	Nov. 8	C. M. C.	3
Captain	J. W. Finch, (I. R. P.)	Staff	18	17	35	Sept. 14	C. M. C.	2
Second Lieut.	E. R. De Bow	D	18	17	35	June 17		1
Corporal	Chas. Muecke	H	18	17	35	June 17		1
First Lieut.	J. P. Jardine, (Com.)	Staff	19	16	35	June 17		3
Private	M. Macgregor	F	20	15	35	June 17		2
Sergeant	Aug. Hewitt	D	21	14	35	June 17		1
Private	G. M. Junker	K	12	22	34	July 4	C. M. C.	
Private	John Buckingham	A	15	19	34	Nov. 8	C. M. C.	
Private	G. A. Kochler	F	15	19	34	July 4	C. M. C.	
First Sergt.	S. A. Quigley	E	16	18	34	Nov. 8	C. M. C.	1

TWENTY-SECOND REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 Yards.	500 Yards.	Total.			
Sergeant	F. F. Martinez	D	16	18	34	June 17		7
Corporal	Jos. F. Karg	E	16	18	34	June 17		
Private	J. T. Mahoney	A	17	17	34	Nov. 8	C. M. C.	2
Corporal	B. F. Tuers	F	18	16	34	June 17		3
Private	H. Collier	B	13	20	33	June 17		
Second Lieut.	W. D. Haws	E	14	19	33	June 17		3
Second Lieut.	A. E. Dick	H	15	18	33	Nov. 8	C. M. C.	5
Private	A. M. Lumley	I	15	18	33	Nov. 8	C. M. C.	3
Private	Edw. Emanuel	A	12	20	32	July 4	C. M. C.	
First Lieut.	H. A. Beneke	K	16	16	32	June 17		4
Sergeant	W. L. Borstleman (Col. B.)	N.C.S	16	16	32	June 17		10
Private	L. F. Buck	G	16	16	32	July 4	C. M. C.	1
First Sergt.	J. P. Kenworthy	A	17	15	32	Aug. 27	C. M. C.	11
Corporal	J. B. Conover, Jr.	B	17	15	32	June 17		4
Q. M. Sergt.	C. S. Bonsall	D	19	13	32	June 17		
Corporal	W. F. Gorham	C	20	12	32	June 17		
Private	W. B. Heward	A	21	11	32	June 17		1
First Sergt.	C. H. Rockwell	I	15	16	31	Nov. 8	C. M. C.	2
Q. M. Sergt.	H. S. Kiernan	B	15	16	31	June 17		3
Private	F. Hendricks	B	16	15	31	June 17		
Private	R. R. Dana	B	17	14	31	July 30	C. M. C.	
Private	W. H. Townsend	G	17	14	31	June 17		
Private	E. Schalk	E	18	13	31	June 17		1
Private	F. M. Schultz	H	11	19	30	June 17		1
Private	F. S. Lawrence	C	13	17	30	Nov. 8	C. M. C.	
Private	V. R. Helmer	E	15	15	30	June 17		2
Corporal	J. A. Spafford	C	16	14	30	June 17		2
Private	J. P. Slingerland	B	16	14	30	June 17		
Sergeant	E. W. Dayton	G	17	13	30	July 4	C. M. C.	
Corporal	D. J. Murphy	B	18	12	30	June 17		1
Sergeant	Jos. C. Kane	E	10	19	29	June 17		2
First Lieut.	J. G. R. Lilliendahl	I	13	16	29	June 17		2
Corporal	J. B. Cavagnaro	A	14	15	29	June 17		1
Private	F. P. Howser	E	17	12	29	June 17		
Private	W. R. Harrison	C	18	11	29	June 17		
Private	R. R. Drysdale	F	18	11	29	July 4	C. M. C.	
Private	A. Hungerbuhler, Jr.	G	18	11	29	July 4	C. M. C.	
Corporal	Harry Ayers	E	19	10	29	July 16	C. M. C.	1
Private	W. H. Fontham	H	9	19	28	July 17		
Private	T. D. Scoble	B	12	16	28	June 17		2
Private	A. R. Bogart	H	12	16	28	June 17		
Sergeant	M. M. Miles	E	13	15	28	June 17		1
Second Lieut.	C. A. DuBois	I	14	14	28	June 17		1
Q. M. Sergt.	C. S. Wehele	C	14	14	28	June 17		1
Private	W. J. Hussey	F	14	14	28	Oct. 15	C. M. C.	
Sergeant	G. T. Nichol	F	15	13	28	July 4	C. M. C.	2
Private	G. E. Wells	B	15	13	28	June 17		
First Sergt.	W. S. Bennett	F	16	12	28	June 17		3
Sergeant	D. Lowenbein	F	16	12	28	June 17		2
Private	Jas. Condon	A	16	12	28	July 4	C. M. C.	
Private	H. I. Bennett	E	16	12	28	June 17		3
Sergeant	W. R. Prescott (Col. B.)	N.C.S	17	11	28	June 17		4
Private	J. Kirchlin, Jr.	A	17	11	28	June 17		
Private	B. S. Hart	K	17	11	28	June 17		1
Corporal	B. M. Levy	K	18	10	28	June 17		2
Private	B. Usher	E	7	20	27	June 17		
Private	H. F. McDougall	C	10	17	27	June 17		
Private	A. T. Weston	E	10	17	27	Nov. 8	C. M. C.	
Private	G. T. Higgins	D	11	16	27	June 17		
Private	H. S. Gassert	C	12	15	27	June 17		
Private	A. B. Hudson	F	13	14	27	June 17		1
Captain	I. H. West	C	15	12	27	June 17		9
Corporal	G. W. Rodgers	H	15	12	27	June 17		
Private	J. Myers	B	15	12	27	Nov. 8	C. M. C.	2
Private	Jos. Jonasson	C	15	12	27	June 17		1
Private	J. W. McDermott	C	15	12	27	June 17		
Private	W. H. Pierrez	F	15	12	27	June 17		2
Private	W. M. Briggs	H	15	12	27	Nov. 8	C. M. C.	
Private	R. L. Welsch	I	15	12	27	June 17		
Corporal	A. S. Hatheway	F	16	11	27	June 17		1

TWENTY-SECOND REGIMENT — *(Concluded).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Corporal	W. R. George	H	16	11	27	June 17		1
Private	G. H. Pollock	H	16	11	27	June 17		
First Lieut	C. M. Skellen	H	17	10	27	June 17		3
Q. M. Sergt	W. E. Haws, Jr	E	17	10	27	June 17		5
Private	E. G. Leidell	I	17	10	27	June 17		
Corporal	C. E. Astin	C	18	9	27	June 17		
Private	F. E. Fuller	F	19	8	27	June 17		
Corporal	C. W. Senior	G	12	14	26	June 17		2
Private	S. C. Bedell	B	12	14	26	June 17		
Private	J. H. Wightman	B	12	14	26	June 17		
Private	W. H. Kemp	C	13	13	26	June 17		
Private	L. E. Julian	D	13	13	26	June 17		
Private	F. Meek	H	13	13	26	June 17		
Private	W. Hamilton	H	14	12	26	June 17		
Private	E. Griffen	B	15	11	26	June 17		
Private	J. Rachie	B	15	11	26	June 17		
Private	E. J. H. Rogers	H	15	11	26	June 17		
Private	H. D. Lindsay	H	16	10	26	June 17		
Private	E. O. Bertholf	C	17	9	26	June 17		
Corporal	F. A. Kramer	E	18	8	26	June 17		2
Lieut.-Col	W. J. Harding	Field	19	7	26	June 17		5
Private	F. A. Vetter	I	8	17	25	June 17		
Sergeant	A. Chellborg	D	9	16	25	June 17		1
Private	La D. M. Knowles	F	9	16	25	Oct. 29	C. M. C.	1
Sergt.-Maj	S. F. Hart	N.C.S	10	15	25	June 17		3
Private	M. J. Conroy	A	10	15	25	Aug. 27	C. M. C.	
Captain	J. P. Leo	I	11	14	25	June 17		9
Private	W. S. Winterbottom	A	12	13	25	June 17		
Private	A. M. Evans	E	12	13	25	June 17		2
Private	R. E. Memberger	I	12	13	25	June 17		
Private	J. E. Praget	I	12	13	25	June 17		
Private	T. H. Cullen, Jr	B	13	12	25	June 17		
Private	F. Vogel, Jr	E	13	12	25	June 17		
Private	J. J. Donohue	H	13	12	25	June 17		
Private	Albert Fox	H	13	12	25	June 17		2
First Lieut	T. J. Miller (Q. M.)	Staff.	14	11	25	June 17		7
Sergeant	J. A. Moore	E	14	11	25	Oct. 15	C. M. C.	1
Corporal	B. R. Henry	H	14	11	25	June 17		
Private	W. P. Beaver	B	14	11	25	June 17		
Private	W. H. Hanley	B	14	11	25	Nov. 8	C. M. C.	4
Private	W. J. Sutton	H	14	11	25	June 17		
Private	W. S. Forestal	K	14	11	25	June 17		1
Corporal	W. A. Cales	D	15	10	25	June 17		
Corporal	C. W. Crochett	E	15	10	25	Aug. 13	C. M. C.	
Private	C. B Balvoort	A	15	10	25	June 17		
Private	G. H. Mathews	B	15	10	25	June 17		
Private	J. E. Briggs	H	15	10	25	Nov. 8	C. M. C.	
First Sergt	H. H. Treadwell	B	16	9	25	June 17		8
Private	D. A. Tonda	A	16	9	25	June 17		
Captain	W. E. Preece	A	17	8	25	June 17		
First Sergt	W. J. Tompkins	K	17	8	25	June 17		4
Private	Paul Weill	D	18	7	25	July 16	C. M. C.	
Private	A. von Anno	G	18	7	25	Nov. 8	C. M. C.	1
Private	J. H. Fitzpatrick	E	19	6	25	June 17		2

Total 150

SIXTY-NINTH REGIMENT.

(Figure of merit..... 35.03.)

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Q. M. Sergt...	F. J. Stuart*.....	C	22	25	47	Nov. 8	C. M. C.....	7
Captain.....	John Ker*.....	K	21	24	45	Sept. 14	C. M. C.....	11
Second Lieut.	P. Farrelly*.....	D	22	23	45	Sept. 6	.....	10
First Sergt...	C. L. Kelly*.....	C	22	23	45	July 19	.....	2
Private	P. Finnegan*.....	C	21	23	44	Sept. 13	C. M. C.....	3
First Lieut...	William Desmond*.....	D	20	23	43	July 19	.....	7
Second Lieut.	L. C. Quinn*.....	I	20	23	43	Nov. 8	C. M. C.....	3
Private	P. A. Ryan*.....	B	21	22	43	Sept. 6	.....	....
Major.....	*Edw. Duffy**.....	F	21	21	42	Sept. 17	C. M. C.....	12
Q. M. Sergt...	W. F. Smith*.....	N.C.S	21	21	42	Aug. 18	.....	4
Private	M. V. Rohan*.....	K	21	21	42	Sept. 6	.....	1
First Lieut...	P. Carroll*.....	F	22	20	42	Sept. 6	.....	2
Sergeant	F. Magee*.....	G	23	19	42	July 19	.....	5
Captain.....	Hugh Coleman.....	E	19	21	40	Aug. 18	.....	6
Captain.....	P. J. Morgan.....	H	19	18	37	Aug. 18	.....	4
Private	M. Shea.....	K	15	21	36	Sept. 6	.....	....
Lieutenant...	James Moran (Adjt.).....	Staff.	18	18	36	July 19	.....	11
Private	W. J. Darcey.....	A	16	19	35	July 19	.....	....
Private	Joseph Duckett.....	G	17	18	35	Sept. 6	.....	....
Private	C. Davenport.....	C	18	17	35	July 19	.....	....
Corporal.....	M. Mann.....	D	19	16	35	July 19	.....	2
Private	J. Bradley.....	C	20	15	35	Sept. 6	.....	....
Private	P. Doyle.....	A	15	19	34	July 19	.....	....
Corporal.....	J. Sullivan.....	D	16	18	34	Sept. 6	.....	1
Private	M. D. Collison.....	K	16	18	34	Sept. 6	.....	....
Sergeant	B. Vernet.....	C	19	15	34	Aug. 18	.....	....
Private	P. J. Howe.....	E	19	15	34	Sept. 6	.....	1
Private	James Farrell.....	H	16	17	33	Aug. 18	.....	....
Private	P. O'Mahony.....	K	16	17	33	July 19	.....	....
Colonel.....	James Cavanagh.....	Field	19	14	33	July 19	.....	8
First Lieut...	William Hogan.....	G	19	14	33	Aug. 18	.....	6
First Lieut...	R. E. Ford.....	Staff.	19	14	33	Aug. 18	.....	...
Second Lieut.	J. B. Monahan.....	E	13	19	32	July 19	.....	2
Private	P. O. Loughlin.....	C	16	16	32	Sept. 6	.....	....
Private	J. N. Dillon.....	E	16	16	32	Sept. 6	.....	....
Private	J. Kerr, Jr.....	K	16	16	32	July 19	.....	....
Private	M. Brady.....	D	17	15	32	July 19	.....	....
First Lieut...	P. F. Leonard.....	B	18	14	32	Sept. 6	.....	4
Private	N. C. Magee.....	G	18	14	32	Sept. 6	.....	1
Second Lieut.	E. F. McCrystal.....	K	19	13	32	July 19	.....	5
Private	J. Foley.....	I	19	13	32	Sept. 6	.....	....
Sergeant	G. O. Hanlon.....	K	20	12	32	Aug. 6	C. M. C.....	....
Private	J. J. Brennan.....	A	20	12	32	July 19	.....	....
Private	W. O. Connell.....	K	21	11	32	Sept. 6	.....	....
Private	T. W. Reilly.....	A	15	16	31	Nov. 8	C. M. C.....	....
Private	F. A. Phillips.....	C	15	16	31	July 19	.....	....
Private	James Moylan.....	G	15	16	31	Sept. 6	.....	....
Captain.....	Thomas Mortimer.....	F	19	12	31	Aug. 18	.....	1
Sergeant	P. M. Deen.....	B	19	12	31	Aug. 29	.....	....
Q. M. Sergt...	P. J. Coleman.....	I	20	11	31	Nov. 8	C. M. C.....	....
Private	Jas. Waldron.....	C	20	11	31	Aug. 1	.....	....
Private	J. Taylor.....	C	12	18	30	July 19	.....	....
Sergeant	R. T. Murtell.....	K	15	15	30	July 19	.....	2
First Sergt...	T. F. Kerr.....	K	16	14	30	July 19	.....	3
Q. M. Sergt...	M. T. Ralph.....	K	16	14	30	Aug. 18	.....	2
Sergeant	R. Lambert.....	N.C.S	16	14	30	July 19	.....	5
Corporal.....	M. Hackett.....	H	16	14	30	Aug. 18	.....	....
Private	R. H. Murphy.....	A	16	14	30	July 19	.....	....
Private	E. Cashin.....	C	16	14	30	July 19	.....	....
Private	John Cassidy.....	K	16	14	30	July 19	.....	....
Ord. Sergt...	D. O'Byrne.....	N.C.S	17	13	30	July 19	.....	2
Private	S. Jones.....	A	17	13	30	Aug. 18	.....	....
Private	M. E. O'Donovan.....	G	17	13	30	July 19	.....	3
Captain	J. J. Cosgrove (Asst. Surg.)	Staff.	18	12	30	Aug. 18	.....	....
Private	M. P. Woods.....	F	18	12	30	Sept. 6	.....	1
Corporal.....	P. Grealy.....	A	19	11	30	July 19	.....	1
Captain.....	D. C. McCarthy.....	C	20	10	30	July 19	.....	8
Private	John Hogan.....	F	20	10	30	July 19	.....	....

SIXTY-NINTH REGIMENT.—*(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	C. Mahon	F	20	10	30	July 19		
Private	M. Scanlon	I	13	16	29	Nov. 8	C. M. C.	1
Private	M. Caulfield	C	14	15	29	Sept. 6		
Private	Thos. Hannighan	K	15	14	29	Sept. 6		
Private	M. McKenna	K	15	14	29	July 19		1
Private	P. H. Cummings	A	16	13	29	Sept. 6		
Private	E. Ranley	C	16	13	29	Aug. 8		
Private	E. A. O'Connor	G	16	13	29	July 19		
Private	H. Dorrity	K	16	13	29	Sept. 6		2
Corporal	P. McDonnell	K	17	12	29	Sept. 6		
Private	M. Supple	A	17	12	29	Sept. 6		
Private	J. N. Commerford	C	17	12	29	July 19		1
Private	J. Adams	D	17	12	29	Sept. 6		
Private	J. Dickson	D	17	12	29	Aug. 18		1
Private	T. Duane	F	17	12	29	Sept. 6		
Private	M. Milmore	K	17	12	29	July 19		
Sergeant	M. Carroll	N.C.S	18	11	29	July 19		3
Sergeant	J. J. Murphy	C	18	11	29	July 19		
Private	J. McEntee	A	18	11	29	July 19		
Private	C. Hanley	C	18	11	29	Aug. 1		
Private	P. Gill	D	18	11	29	Sept. 6		
Private	J. W. Monaghan	K	18	11	29	July 19		
Private	J. J. Glynn	C	19	10	29	Aug. 1		
Private	W. J. Kennedy	F	19	10	29	Sept. 6		
Private	L. S. Quinn	K	19	10	29	Sept. 19		
Private	P. Spellman	K	8	20	28	July 19		
Sergeant	P. Hayer	G	12	16	28	July 19		1
Private	P. J. Foley	A	12	16	28	Aug. 18		
Captain	M. Cox	D	13	15	28	July 19		4
Private	J. Lambert	C	13	15	28	Sept. 6		
Private	D. N. Dillon	E	13	15	28	Sept. 6		
Private	P. Shea	K	13	15	28	Sept. 6		
Private	J. J. McCoy	B	14	14	28	Sept. 6		
Private	J. Matthews	D	14	14	28	Sept. 6		
Private	J. J. Somers	G	14	14	28	Sept. 6		
Private	J. Duggan	B	15	13	28	July 19		
Private	J. Henry	C	15	13	28	July 19		1
Private	G. T. Roome	C	15	13	28	Aug. 1		
Private	J. Sott	C	15	13	28	July 19		
Private	M. F. Slater	C	15	13	28	July 19		
Captain	M. Brennan	A	16	12	28	Nov. 8	C. M. C.	6
Sergeant	H. P. Mangam	G	16	12	28	Sept. 6		
Sergeant	J. D. O'Connell	H	16	12	28	Aug. 18		1
Private	J. Crowley	D	16	12	28	Sept. 6		
Private	M. Byrnes	D	16	12	28	Sept. 6		
Private	W. V. Cassidy	K	16	12	28	July 19		
First Sergt.	J. D. Quick	G	17	11	28	Sept. 6		
Private	M. Hoey	C	17	11	28	July 19		
Private	J. Dowling	F	17	11	28	Sept. 6		1
Private	W. Malloy	C	18	10	28	Sept. 6		
Private	W. Maher	D	18	10	28	Sept. 6		
Private	W. Ralph	F	18	10	28	Aug. 18		1
Private	P. F. Coughlin	K	18	10	28	Sept. 6		
Second Lieut	J. O'Counell	C	19	9	28	Aug. 1		
Q. M. Sergt.	D. L. O'Leary	G	19	9	28	Aug. 18		
Private	C. Darcy	C	19	9	28	Aug. 1		
Private	J. Brady	F	7	20	27	July 19		
Private	J. McCloskey	C	9	18	27	July 19		1
Private	T. E. Towsey	C	11	16	27	July 19		
Private	P. Markey	K	13	14	27	Sept. 6		
Sergeant	R. Browne	E	14	13	27	July 19		
Corporal	T. Flynn	C	14	13	27	July 19		
Private	P. Flood	C	14	13	27	Aug. 18		
Private	J. J. Monaghan	G	14	13	27	Aug. 18		
Private	T. Parker	G	14	13	27	July 19		
Private	Jas. Berett	K	14	13	27	Sept. 6		
Sergeant	S. Higgins	C	15	12	27	Aug. 18		
Private	W. Kellighom	C	15	12	27	Aug. 18		
Private	H. McOstrich	C	15	12	27	July 19		
Private	G. Johnson	D	15	12	27	Sept. 6		

SIXTY-NINTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Totals.			
Private	J. Cavanagh	E	15	12	27	Sept. 6		
Private	J. Kearns	F	15	12	27	July 19		1
Private	M. J. Mahoney	G	15	12	27	July 19		
First Lieut.	J. Murphy	C	16	11	27	July 19		2
Private	J. Healy	C	16	11	27	July 19		
Private	W. F. Phillips	C	16	11	27	Aug. 18		
Private	P. M. Slattery	C	16	11	27	July 19		
Private	M. Slattery	C	16	11	27	July 19		
Private	P. Clancy	D	16	11	27	Sept. 6		1
Private	T. Hanley	D	16	11	27	Sept. 6		1
Private	M. Mulligan	D	16	11	27	Aug. 18		
Private	L. Burke	F	16	11	27	Sept. 6		
Private	J. Wallace	F	16	11	27	Sept. 6		
Private	J. Grace	C	17	10	27	July 19		
Private	M. Flaherty	C	17	10	27	July 19		
Private	G. J. Foster	E	17	10	27	Nov. 8	C. M. C.	2
Sergeant	F. Lackey	D	18	9	27	Aug. 18		
Private	M. J. Dwyer	C	18	9	27	July 19		
Private	J. Horn	C	18	9	27	Aug. 18		
Private	S. Haybun	C	18	9	27	Aug. 1		
Private	P. Murphy	C	18	9	27	July 19		
Private	J. J. Magner	C	18	9	27	Aug. 18		
Private	S. S. O'Connor	C	18	9	27	Aug. 1		
Private	J. V. McKeon	G	18	9	27	July 19		1
Private	J. Flaherty	C	19	8	27	Aug. 1		
Private	J. J. Mullahey	C	19	8	27	July 19		
Private	J. O. G. Murphy	C	11	15	26	July 19		
Private	J. J. Miskell	A	12	14	26	July 19		
Private	M. Costin	G	12	14	26	July 19		
Sergeant	H. Richardson	A	13	13	26	Sept. 6		3
Sergeant	R. Eagan	K	13	13	26	July 19		
Private	W. Daly	B	13	13	26	Sept. 6		
Private	T. F. Lynch	C	13	13	26	Aug. 18		
Private	T. Daley	F	13	13	26	Sept. 6		
Private	T. Haverty	F	13	13	26	Sept. 6		
Private	John Lynch	F	13	13	26	Sept. 6		
Private	J. H. Fisher	G	13	13	26	Sept. 6		
Captain	S. R. Ryan	G	14	12	26	July 19		7
Corporal	T. Cremin	G	14	12	26	Sept. 6		
Private	T. Corbett	C	14	12	26	Sept. 6		
Private	W. J. Donnelly	C	14	12	26	July 9		
Private	S. Sweeny	E	14	12	26	July 19		
Private	James McConlogue	G	14	12	26	July 19		
Private	M. Roach	G	14	12	26	July 19		
Private	C. C. Morton	H	14	12	26	Aug. 18		
Sergeant	T. J. Coleman	A	15	11	26	Aug. 1		1
Corporal	S. Murphy	H	15	11	26	Sept. 6		
Private	M. J. Frawley	D	15	11	26	Aug. 18		
Private	W. Kearns	D	15	11	26	Sept. 6		
Private	D. Nash	D	15	11	26	Aug. 18		
Private	P. Whalen	F	15	11	26	Sept. 6		
Private	James Lawler	K	15	11	26	July 19		
Private	H. J. Morrisey	K	15	11	26	July 19		
Second Lieut.	J. J. Scanlan	F	16	10	26	July 19		2
First Sergt.	J. J. Healy	I	16	10	26	Sept. 6		1
Sergeant	J. P. Devine	F	16	10	26	Sept. 6		
Sergeant	P. J. Morgan	H	16	10	26	Aug. 18		
Private	T. Wall	A	16	10	26	July 19		
Private	M. Donohue	F	16	10	26	Aug. 18		
Private	P. M. Smith	K	16	10	26	July 19		
Sergeant	R. Hayes	C	17	9	26	July 19		
Private	M. Byrnes	C	17	9	26	July 19		
Private	P. Conway	D	17	9	26	Sept. 6		
Private	T. Campbell	D	17	9	26	Sept. 6		
Private	T. Airy	F	17	9	26	Aug. 18		1
Private	N. Doyle	F	17	9	26	Aug. 18		
Private	J. J. Kernan	F	17	9	26	Aug. 18		
Corporal	W. Kelly	K	18	8	26	Sept. 6		
Private	E. Brick	A	18	8	26	July 19		
Private	M. Lynch	D	18	8	26	Aug. 18		

SIXTY-NINTH REGIMENT — *(Concluded).*

RANK.	Name.	Company.	Scores. 200 yards.	Scores. 400 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	J. Kane	F	18	8	26	July 19		
Private	Wm. Doyle	H	18	8	26	Sept. 6		
Sergeant	John Gleason	I	19	7	26	Aug. 18		3
Corporal	P. Solan	C	19	7	26	Aug. 1		
Private	T. J. McGuinness	C	19	7	26	July 19		1
Private	T. Murphy	F	19	7	26	Aug. 18		
Q. M. Sergt.	J. Behan	B	20	6	26	Aug. 18		8
Private	J. J. Van Riper	C	20	6	26	July 19		2
Private	O. Gilton	D	5	20	25	July 19		
Private	J. Murhy	E	7	18	25	July 19		
Private	J. Bergen	E	8	17	25	Sept. 6		
Private	A. McArdle	A	10	15	25	Sept. 6		2
Corporal	E. Kiss	B	12	13	25	Sept. 6		
Private	E. T. Duffy	K	12	13	25	July 19		
Private	P. Sweeney	K	12	13	25	July 19		
Sergeant	R. P. Bryne	F	13	12	25	July 10		1
Private	G. Lackey	D	13	12	25	July 19		
Private	T. Brady	I	13	12	25	Nov. 8	C. M. C.	1
Private	W. L. Dooley	K	13	12	25	Aug. 13	C. M. C.	
Private	J. J. Griffin	A	14	11	25	Sept. 6		1
Private	J. J. Dunnigan	C	14	11	25	July 19		
Private	T. Fallon	F	14	11	25	Sept. 6		
Q. M. Sergt.	C. Curran	F	15	10	25	July 19		
Private	J. McMahon	C	15	10	25	Aug. 18		
Private	T. Monaghan	D	15	10	25	Aug. 18		
Private	D. Gurneay	F	15	10	25	Sept. 6		
Private	T. Hegan	D	16	9	25	July 19		
Private	J. Murtha	D	16	9	25	Aug. 18		
Private	John McNally	F	16	9	25	Sept. 6		
Private	J. McCabe	F	16	9	25	Sept. 6		
Private	P. Maloy	I	16	9	25	Nov. 8	C. M. C.	
Corporal	J. J. Leving	C	17	8	25	July 19		2
Corporal	J. McCarthy	K	17	8	25	Sept. 6		
Private	P. King	C	17	8	25	Aug. 1		
Private	M. Graham	F	17	8	25	Aug. 18		
Private	L. Dolan	G	17	8	25	Aug. 18		
Private	J. Barnes	C	21	4	25	July 19		

Total 245

SEVENTY-FIRST REGIMENT.

(Figure of merit ..... 33.82.)

RANK.	Name.	Company.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Captain	A. P. Delcambre*	H	20	22	42	Aug. 18		5
Captain	L. F. Barry*	I	22	20	42	Aug. 29		3
Private	G. Williams	D	18	20	38	Nov. 10		
Captain	W. A. Prior, (Asst. Surg.)	Staff	19	18	37	Nov. 10		
Private	W. A. McGalliard	H	19	18	37	Aug. 18		
Major	E. T. T. Marsh, (Surg.)	Staff	15	21	36	Aug. 29		2
Lieut.-Col	J. A. Denison	F	16	20	36	Nov. 10		
Second Lieut.	M. D. Ginry	I	18	18	36	Aug. 29		5
First Sergt.	A. Myers	G	21	15	36	Nov. 10		1
Second Lieut.	J. N. Golding	C	14	21	35	Nov. 10		2
Q. M. Sergt.	W. S. Gleason	H	16	19	35	Aug. 29		8
Private	Chas. Le More	D	16	19	35	Aug. 29		
Q. M. Sergt.	G. D. Hobart	K	19	15	34	Nov. 10		1

SEVENTY-FIRST REGIMENT—*(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Lieut.-Col	F. Kopper	F	16	17	33	Aug. 29		6
Private	W. P. Brudi	C	17	16	33	Nov. 10		
Private	C. D. Mayorga	C	20	13	33	Aug. 29		
Second Lieut.	C. H. Smith	B	16	16	32	Sept. 5		
Private	L. W. Francis	C	17	15	32	Aug. 29		
Private	Geo. Gurner	F	18	14	32	Nov. 10		
Sergeant	G. F. Ruggles	G	21	11	32	Nov. 10		
Private	E. B. Bogart	B	21	11	32	Nov. 10		
Private	J. T. Yates	H	21	11	32	Nov. 10		
Private	J. Kearney	C	11	20	31	Nov. 10		
Private	E. C. Pickard	A	17	14	31	Aug. 29		
Sergeant	J. F. Quinn	A	18	13	31	Aug. 29		
Private	J. H. Kottman	G	21	10	31	Nov. 10		
Sergeant	D. E. Watson	A	11	19	30	Nov. 10		3
Captain	J. E. Place	G	14	16	30	Aug. 29		2
First Lieut	W. A. Downs, (Adj.)	Staff	16	14	30	Aug. 29		
Private	A. P. Bruederline	C	19	11	30	Nov. 10		
Private	G. B. McWhinney	F	19	11	30	Nov. 10		1
Sergeant	W. H. Myers	H	22	8	30	Nov. 10		
Corporal	A. J. Roberts	H	23	7	30	Nov. 10		1
Private	J. C. Denison	B	15	14	29	Sept. 5		
Second Lieut.	W. T. Gouch	A	16	13	29	Aug. 5		
Corporal	A. C. Leibeneichen	H	16	13	29	June 18	C. M. C.	3
Private	F. A. Boylan	F	16	13	29	Nov. 10		
Captain	W. D. Goss	K	18	11	29	Nov. 10		3
Sergeant	W. S. Reid	G	20	9	29	Nov. 10		
Corporal	H. M. Kirk	I	21	8	29	Nov. 10		
Private	E. J. Price	A	14	14	28	Aug. 29		1
Private	W. E. Carpenter	C	14	14	28	Nov. 10		
Private	W. J. Westby	D	14	14	28	Aug. 29		
Captain	F. W. Gwyer, (Asst. Surg.)	Staff	15	13	28	Aug. 29		2
Corporal	R. A. Barry	I	16	12	28	Sept. 5		2
Private	A. F. Trafford	B	16	12	28	Nov. 10		
Private	H. W. Britton	G	16	12	28	Nov. 10		
First Lieut	*D. H. Teets*	D	17	11	28	Nov. 10		12
Sergt. Major	J. F. Kohnen	N.C.S	18	10	28	Aug. 29		
Private	J. D. Burtis	C	18	10	28	Nov. 10		
Private	P. H. Mignard	A	19	9	28	Nov. 10		
Private	W. S. Young	B	19	9	28	Aug. 29		
Corporal	S. Wilks	I	20	8	28	Nov. 10		1
Sergeant	A. J. McGregor	I	13	14	27	Aug. 29		1
Second Lieut.	C. B. Stone	D	14	13	27	Aug. 29		1
Private	C. J. Dunne	A	14	13	27	Nov. 10		
Private	H. J. Hargrave	D	15	12	27	Aug. 29		
Private	W. H. Lyons	H	16	11	27	Nov. 10		
Private	H. J. McCartin	I	16	11	27	Aug. 29		1
Ord. Sergeant	R. Rockfeller	N.C.S	18	9	27	Aug. 29		1
Private	I. I. Martin	G	18	9	27	Nov. 10		
Private	T. F. Murray	H	18	9	27	Nov. 10		
Private	J. O. Nelson	A	19	8	27	Nov. 10		
First Sergt	C. M. Davis	I	20	7	27	Aug. 29		1
Corporal	J. C. Ryan	K	21	6	27	Nov. 10		
First Sergt	W. H. Orson	B	10	16	26	Nov. 10		
First Lieut	P. V. Harris	F	12	14	26	Nov. 10		3
Private	C. Praul	A	13	13	26	Nov. 10		
Private	B. Pick	A	14	12	26	Aug. 29		
Private	J. N. Kilroy	D	14	12	26	Nov. 10		
Private	E. P. Blackwell	K	14	12	26	Nov. 10		1
Private	A. H. Paul	B	15	11	26	Sept. 5		
Private	I. Cran	I	15	11	26	Aug. 29		
Private	R. Moonny	I	15	11	26	Nov. 10		
Lieutenant	W. E. D. Stokes (Qrmr.)	Staff	16	10	26	Nov. 10		
Private	C. S. Copeland	C	17	9	26	Nov. 10		
Private	E. J. Conlon	I	17	9	26	Nov. 10		
Private	W. A. Dalton	A	19	7	26	Nov. 10		1
Private	J. R. Hennessy	G	19	7	26	Nov. 10		
Private	H. C. Stahl	B	21	5	26	Nov. 10		
First Lieut	W. L. Royall	C	9	16	25	Aug. 29		4
Sergeant	F. Sheckelton (Color B.)	N.C.S	14	11	25	Aug. 29		
Corporal	C. G. Reton	B	14	11	25	Aug. 29		

SEVENTY-FIRST REGIMENT — *(Concluded).*

RANK.	NAME.	Company.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	Wm. Beggs	D	14	11	25	Aug. 29		....
Private	F. W. Anderson	I	14	11	25	Aug. 29		....
Private	John Fickinger	K	14	11	25	Aug. 29		1
Private	Chas. Gieiner	K	14	11	25	Nov. 10		....
Private	M. C. O'Brein	B	15	10	25	Sept. 5		....
First Lieut	E. C. O'Brein	A	16	9	25	Aug. 29		1
Private	Jac. Schwartz	H	16	9	25	Aug. 29		....
Private	J. J. Joos, Jr	I	16	9	25	Aug. 29		1
Captain	C. M. Kennedy	A	17	8	25	Aug. 29		1
Corporal	H. J. Matzke	D	17	8	25	Aug. 29		....
Corporal	John Miller, Jr	K	17	8	25	Aug. 29		2
Private	R. Stokes	A	17	8	25	Nov. 8	C. M. C.	2
Private	S. N. Whiting	A	17	8	25	Nov. 10		....
Private	L. J. Kaiser	C	17	8	25	Nov. 10		....
Private	W. Fearis	D	17	8	25	Nov. 10		1
Private	L. Struble	A	18	7	25	Nov. 10		1

Total 99

SECOND BRIGADE.

(Figure of merit..... ..... 53.48.)

GENERAL AND STAFF.

(Figure of merit..... 83.33.)

RANK.	Name.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Lieut.-Col	*J. B. Frothingham**	20	24	44	Aug. 6	C. M. C.	12
Major	G. L. Fox *	20	24	44	May 28	C. M. C.	9
Brig.-Gen	Jas. McLeer	20	14	33	May 20		11
Captain	Fritz Brosé	17	15	32	July 16	C. M. C.	2
Major	W. C. Sanger	19	11	30	Nov. 8	C. M. C.	1
Major	G. R. Fowler	18	10	28	May 20		4
Major	Frank Lyman	12	15	27	May 20		1
Major	G. A. Jahn	13	14	27	May 20		1
Captain	F. D. Beard	17	10	27	May 20		....
Major	Geo. Kinkel, Jr.	13	12	25	May 20		1

Total ..... 10.

THIRTEENTH REGIMENT.

(Figure of merit..... 62.08.)

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Corporal.....	S. F. Fahnestock *.....	I	22	25	47	Oct. 29	C. M. C.....	2
Private	G. W. Lotz*.....	G	24	23	47	Sept. 17	C. M. C.....	2
Private	W. F. Cody*.....	K	23	23	46	June 18	C. M. C.....	1
Ord. Sergt....	Jas. McNevin*.....	N.C.S	20	25	45	Sept. 14	C. M. C.....	10
Private	T. G. Austin *.....	G	21	24	45	June 18	C. M. C.....	7
Major.....	E. de la Verne (Surg.)*....	Staff.	22	23	45	Oct. 1	C. M. C.....	4
Sergeant	G. A. Lane*.....	A	22	23	45	Oct. 29	C. M. C.....	5
Private	H. W. Kraft*.....	K	22	23	45	Aug. 6	C. M. C.....	4
Corporal.....	M. B. Flynt*.....	K	23	22	45	July 4	C. M. C.....	4
Private	H. G. Morris*.....	G	24	21	45	July 4	C. M. C.....	4
Sergeant	G. E. Constable*.....	F	22	22	44	Sept. 14	Sec. Brig....	6
First Lieut...	W. H. Cochran*.....	K	22	21	43	June 14	.....	3
Private	F. R. Wiswell*.....	A	19	23	42	Oct. 29	C. M. C.....	....
Corporal.....	F. P. De Vigne*.....	D	20	22	42	June 14	.....	2
First Sergt...	G. C. Broome.*.....	I	22	20	42	Oct. 27	.....	....
Private	V. Werner*.....	H	22	20	42	Nov. 8	C. M. C.....	1
Private	W. Beckley	K	18	20	38	Aug. 9	.....	....
Private	L. Wahler.....	K	18	20	38	Aug. 9	.....	....
Sergeant	J. F. Cooper.....	D	19	19	38	June 14	.....	5
Private	S. Childs	G	20	18	38	June 7	.....	4
Private	F. M. Flatten	K	20	18	38	Sept. 6	.....	1
Private	J. J. Teernan	F	21	17	38	Aug. 9	.....	5
Captain.....	W. L. Watson.....	G	22	16	38	June 7	.....	8
Private	W. M. Sommers.....	H	17	20	37	Aug. 9	.....	8
Private	C. A. Chute.....	I	17	20	37	Sept. 6	.....	....
Private	D. C. Thayer.....	C	20	17	37	Nov. 10	.....	....
Private	R. Black.....	D	20	17	37	Aug. 9	.....	1
Private	A. A. Hayward.....	G	20	17	37	June 7	.....	4
Sergeant	T. J. Hooley.....	K	14	12	36	June 14	.....	1
First Lieut...	C. P. Fish.....	C	17	19	36	June 14	.....	5
Private	W. A. Bow, Jr.....	K	18	18	36	Aug. 9	.....	....
First Sergt...	H. A. Williams.....	G	19	17	36	Oct. 27	.....	1
Private	A. O. Waters.....	C	17	18	35	Oct. 27	.....	....
Private	William Ferry.....	B	18	17	35	Aug. 9	.....	2
Private	F. A. Morris.....	B	18	17	35	Oct. 37	.....	1
Private	A. B. Arnolt.....	D	18	17	35	June 14	.....	4
Private	J. A. Finik.....	G	18	17	35	Oct. 27	.....	3
Private	T. W. Northridge.....	K	18	17	35	Oct. 14	.....	....
Private	E. A. Kirby.....	K	19	16	35	Aug. 9	.....	....
Sergeant	H. E. Brown.....	A	15	19	34	June 14	.....	3
Sergeant	C. A. Fass, Jr.....	D	18	16	34	Aug. 9	.....	4
Sergeant	G. C. Butcher	H	18	16	34	Aug. 9	.....	1
Private	O. R. Robinson.....	I	18	16	34	Nov. 10	.....	....
First Lieut...	R. H. Sillman	F	19	15	34	June 14	.....	8
Second Lieut.	W. H. Coughlin.....	B	14	19	33	June 7	.....	1
Private	Thomas Chadwick.....	E	14	19	33	Aug. 9	.....	....
Private	M. A. Dotten.....	G	15	18	33	Aug. 18	.....	1
Private	D. F. Hill.....	G	15	18	33	June 7	.....	1
Private	L. H. C. Savage.....	H	15	18	33	Sept. 6	.....	....
Major.....	J. Fred. Ackerman.....	Field	16	17	33	June 7	.....	10
Q. M. Sergt...	R. A. Riker.....	N.C.S	16	17	33	June 7	.....	7
Corporal.....	T. W. Buddleman.....	F	16	17	33	June 14	.....	3
Private	J. H. Doyle.	F	17	16	33	Aug. 27	C. M. C.....	....
First Sergt...	A. Owen.....	D	18	15	33	June 14	.....	9
Corporal.....	O. F. Lorenberg	G	18	15	33	Nov. 8	C. M. C.....	....
Corporal.....	W. F. Boden.....	I	18	15	33	Aug. 9	.....	1
Private	E. B. Haywood.....	D	18	15	33	June 14	.....	1
Private	C. P. Jung.....	B	19	14	33	June 14	.....	1
First Sergt...	A. H. Linn.....	F	20	13	33	June 14	.....	3
Private	W. C. Eccles.....	A	12	20	32	Aug. 27	.....	....
Q. M. Sergt...	H. C. Codington.....	G	14	18	32	June 7	.....	8
Private	G. E. Holmes	A	15	17	32	June 14	.....	....
Private	M. A. Doherty.....	H	15	16	32	Aug. 9	.....	....
Private	A. E. T. Sohns.....	C	16	16	32	June 14	.....	....
Private	A. A. Klingman.....	I	16	16	32	Sept. 6	.....	....
Captain.....	S. W. Smith.....	C	17	15	32	June 14	.....	7
Corporal.....	R. R. Welch.....	E	17	15	32	Nov. 8	C. M. C.....	....

THIRTEENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	C. E. Schultz	C	19	13	32	Nov. 8	C. M. C.	3
Captain	William Kirby	E	14	17	31	June 7		3
Private	A. G. Morris	I	15	16	31	Sept. 6		
Q. M. Sergt.	E. J. Anderson	F	16	15	31	June 14		
Private	M. Deering	F	16	15	31	Oct. 27		1
Private	T. Simmons, Jr.	B	17	14	31	June 7		7
Private	A. L. Westcott	H	17	14	31	June 7		2
Private	L. Gau, Jr.	I	17	14	31	June 7		1
Private	A. Magarino	K	17	14	31	June 14		
Private	L. B. Hamilton	G	18	13	31	June 14		
Captain	D. F. Lucas (Asst. Surg.)	Staff.	20	11	31	June 14		
Private	H. W. Forsbury	C	21	10	31	June 14		
Corporal	W. Wenzenberger	D	11	19	30	Aug. 9		
Corporal	A. L. Rivenbergh	E	12	18	30	Aug. 9		
Private	J. A. Kane	A	12	18	30	Aug. 9		
Private	W. E. Blauvelt	F	12	18	30	June 14		
Private	F. H. De Witt	H	12	18	30	June 7		
Private	J. A. Little	K	12	18	30	Oct. 13		2
First Lieut	C. W. Topping (Q. M.)	Staff.	13	17	30	June 7		1
Private	Wm. Deisel	D	14	16	30	June 14		
Private	H. H. Frary	D	14	16	30	June 14		
Private	C. W. Yorxsae	D	14	16	30	Aug. 9		
Private	J. E. Sharp	E	15	15	30	Aug. 9		
Private	W. Roch	H	15	15	30	June 7		
Private	F. E. Johnson	I	15	15	30	Aug. 9		
Private	C. W. Knobel	I	15	15	30	Sept. 6		
Captain	C. O. Davis	D	16	14	30	June 14		4
Sergeant	J. T. Baxter	G	16	14	30	June 7		8
Corporal	J. F. Goodwin	B	16	14	30	Oct. 27		
Private	J. F. Abrams, Jr.	E	16	14	30	June 7		1
Com. Sergt.	H. Smith	N.C.S	17	13	30	Aug. 9		3
Corporal	A. Parker	F	17	13	30	June 14		5
Private	A. P. Chichester	A	19	11	30	June 14		1
Private	D. Desmond	A	12	17	29	Aug. 9		3
Private	C. L. Sowns	K	12	17	29	Oct. 27		
Sergeant	Geo. Sandhusen (L. G. G.)	N.C.S	13	16	29	June 7		1
Private	A. Hinze	B	13	16	29	June 7		
Private	M. Remmington	H	13	16	29	July 4	C. M. C.	
Second Lieut.	F. G. Peobles	D	14	15	29	June 14		
Private	W. H. Rossell	B	14	15	29	June 14		
Private	M. J. McKenna	C	14	15	29	Aug. 9		
Private	S. Benton	I	14	15	29	Aug. 29		
Corporal	F. F. Princkard, Jr.	A	15	14	29	Oct. 27		
Corporal	E. W. Bryan	I	15	14	29	Aug. 9		
Private	H. Weeks	D	15	14	29	June 14		1
Captain	*W. J. Collins*	A	16	13	29	June 14		12
Corporal	G. S. Lord	K	16	13	29	June 14		
Corporal	E. P. Norwood	K	16	13	29	June 14		4
Private	W. M. Fowler	I	16	13	29	Sept. 6		
Private	S. L. Kennedy	I	16	13	29	Aug. 9		
Private	W. F. Holmes	K	16	13	29	June 14		1
First Sergt	C. H. Higgins	B	17	12	29	June 7		5
Private	E. F. Beal	C	17	12	29	Aug. 9		
Private	E. H. Bennett	H	17	12	29	June 14		1
Private	F. Rodriguez	K	17	12	29	June 14		
First Sergt	M. J. Colligan	C	18	11	29	June 14		1
Private	T. W. Leonard	C	18	11	29	June 14		3
Private	G. A. Wilson	H	18	11	29	Aug. 9		1
Sergeant	E. J. Comotte	D	19	10	29	June 14		
Private	J. M. McQueen	G	19	10	29	June 7		1
Private	C. E. Neil	B	16	9	25	Nov. 8	C. M. C.	
Private	C. E. Penny	B	16	9	25	Aug. 9		
Second Lieut.	J. Alexander	F	10	18	28	June 14		2
Corporal	W. M. Brown	D	11	17	28	Aug. 9		1
Private	J. E. Emmerson	G	11	17	28	Aug. 9		1
Private	W. L. Easson	G	12	16	28	June 7		
Corporal	C. A. Warner	K	13	15	28	June 14		
Corporal	C. A. Smith	A	14	14	28	Aug. 9		1
Private	L. F. Du Flor	F	14	14	28	June 14		3
Private	W. M. McElroy	F	14	14	28	June 14		

THIRTEENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	G. E. Collins	G	15	13	28	Aug. 9		....
Private	W. Donoghy, Jr.	K	15	13	28	June 14		....
Sergeant	F. M. Rowley	K	16	12	28	June 14		....
Corporal	J. E. Parsons	G	16	12	28	Aug. 9		1
Corporal	R. F. Woehr	H	16	12	28	June 7		1
Private	J. F. Gordon	E	16	12	28	Aug. 9		....
Private	D. F. Ray	E	16	12	28	June 7		2
Private	W. Johnson	I	16	12	28	Aug. 22		....
Private	J. H. Butler	K	16	12	28	Sept. 6		....
Captain	R. P. Morle	K	17	11	28	June 7		10
Private	T. Fletcher, Jr.	A	17	11	28	Aug. 9		1
Private	J. J. Woehr	F	17	11	28	June 14		3
Private	G. H. R. Easson	G	17	11	28	Oct. 27		....
Private	L. Hubbs	I	17	11	28	Aug. 9		....
Private	E. A. Kraft	K	21	7	28	June 14		2
Private	G. F. Bishop	K	9	18	27	Oct. 27		....
Sergeant	J. A. Clairy	N.C.S	12	15	27	June 14		....
Sergeant	J. E. Ramsbotham	A	12	15	27	June 4		4
Sergeant	G. R. Hazard	G	12	15	27	June 14		3
Private	C. H. Wiswell, Jr.	A	12	15	27	Oct. 27		....
Private	G. Pettit, Jr.	F	12	15	27	Oct. 27		1
Sergeant	E. H. Narwood	N.C.S	13	14	27	June 7		2
Sergeant	E. A. Whitman	K	13	14	27	June 14		1
Private	B. R. Laing	D	13	14	27	Oct. 27		....
Private	G. W. Smith	I	13	14	27	June 7		....
Corporal	G. W. Clackner	D	14	13	27	June 14		1
Private	J. H. Colligan	C	14	13	27	June 14		....
Private	W. N. Logan	D	14	13	27	June 14		....
Private	C. R. Mathews	E	14	13	27	June 30		....
Private	W. B. Clickner	G	14	13	27	June 7		....
Private	J. D. Lloyd	K	14	13	27	June 7		....
Sergeant	C. G. Curtis (Hos. Stew.)	N.C.S	15	12	27	June 14		1
Corporal	F. C. Murphy	C	15	12	27	June 14		....
Private	A. I. Easson	G	15	12	27	June 14		....
Private	C. W. Smith	G	15	12	27	Aug. 9		....
Private	J. H. Yancle	H	15	12	27	June 14		3
Private	J. Dooley	I	15	12	27	Aug. 18		....
Private	J. M. Hayes	I	15	12	27	Aug. 9		....
Private	C. H. Strong	I	15	12	27	June 7		1
Private	J. Demorest	K	15	12	27	June 14		....
Private	C. H. Northridge	K	15	12	27	June 14		1
Corporal	G. H. Beuerman	B	16	11	27	Aug. 19		....
Corporal	E. E. Thomas	E	16	11	27	Oct. 27		2
Corporal	W. J. Clark	F	16	11	27	June 14		1
Private	C. M. Clark	A	16	11	27	June 14		....
Private	H. Mehrlander	A	16	11	27	June 14		1
Private	D. Van Hauten	G	16	11	27	June 7		....
Private	H. M. Wheeler	G	16	11	27	Aug. 9		1
Private	J. Doyle	K	16	11	27	June 14		....
Private	F. P. Jenks	I	16	11	27	Aug. 9		....
Private	W. F. Rose	I	16	11	27	Aug. 9		....
Private	J. W. Westerman	K	16	11	27	June 14		....
Corporal	W. B. Leisler	I	17	10	27	Aug. 9		....
Private	L. S. Cole	H	17	10	27	Oct. 27		3
Private	T. S. Woodcock	I	17	10	27	June 7		....
Captain	W. Powell	B	18	9	27	June 14		....
Sergt. Major	E. Roch	N.C.S	18	9	27	June 14		....
Sergeant	W. S. Gender	B	18	9	27	June 14		2
Corporal	F. L. Edgette	E	18	9	27	June 7		....
Corporal	A. A. Hodgkinson	H	18	9	27	Aug. 18		1
Private	B. N. McQueen	G	18	9	27	June 7		1
Private	G. H. L. Varidmann	G	18	9	27	Oct. 27		1
Private	J. H. Cashman	I	18	9	27	Aug. 25		1
Corporal	W. L. Hudson	B	19	8	27	Aug. 9		2
Corporal	J. C. Corbet	G	19	8	27	June 7		2
Private	J. P. Van Horne	I	19	8	27	Aug. 9		....
Corporal	J. F. Doscher	E	9	17	26	June 7		....
Private	C. E. Williams	B	9	17	26	June 30		....
Private	H. S. Hingle	D	9	17	26	Aug. 9		....
Private	C. A. Winslow	E	9	17	26	Oct. 27		....

THIRTEENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	W. W. Wickes	B	10	16	26	June 7		
Private	C. O. Fransecky	A	11	15	26	June 14		
Private	F. W. Kenneke	C	11	15	26	Aug. 9		1
Private	H. A. Steinmeck	C	12	14	26	June 14		
Private	S. L. Morgan	D	12	14	26	June 14		
Private	R. D. Hegeman	G	12	14	26	Aug. 9		
Private	W. Lewis	K	12	14	26	June 14		
Q. M. Sergt.	S. Grant	D	13	13	26	June 14		
Sergeant	M. M. Kelly	I	13	13	26	June 7		
Corporal	H. B. Baldwin	B	14	12	26	Aug. 18		
Private	W. H. Johnson	C	14	12	26	Oct. 27		
Private	W. C. Harrison	E	14	12	26	Aug. 9		
Private	P. W. Kretchmeier	G	14	12	26	June 14		
Private	C. F. Donohue	H	14	12	26	June 7		
Private	A. C. Cleveland	I	14	12	26	Oct. 27		
Private	H. Kammerier	I	14	12	26	Sept. 6		
Private	E. E. Tixier	I	14	12	26	June 7		
Private	H. H. Leigh	E	15	11	26	June 7		1
Private	J. D. Jarrett	G	15	11	26	Nov. 8	C. M. C.	
Corporal	C. H. Miller	C	16	10	26	June 14		
Private	T. C. Patterson	A	16	10	26	Oct. 27		
Private	F. F. Marguand	C	16	10	26	Aug. 9		1
Private	W. H. Wilson, Jr.	F	16	10	26	Oct. 27		3
Private	F. J. Bushnell	G	16	10	26	Oct. 27		
Private	F. S. Meeker	I	16	10	26	Sept. 6		
Private	A. M. Klucken	K	16	10	26	June 14		
Q. M. Sergt.	T. S. Gender	B	17	9	26	June 7		2
Corporal	E. H. Coffin, Jr.	G	17	9	26	June 7		1
Private	F. E. Harrison	E	17	9	26	June 7		
Private	R. H. Hoag	E	17	9	26	June 7		2
Private	I. F. Baker	G	17	9	26	Aug. 9		
Private	J. B. Bateman	G	17	9	26	Aug. 9		
Private	J. W. Cochran	G	17	9	26	June 14		
Private	W. E. Collins	G	17	9	26	Aug. 9		
Q. M. Sergt.	E. Phillips	I	18	8	26	June 7		
Private	A. Salratino	I	18	8	26	Aug. 9		
Private	W. H. Bishop, Jr.	K	18	8	26	June 14		
Second Lieut.	G. G. Cochran	I	19	7	26	June 7		1
Sergeant	W. Robertson (R. G. G.)	N.C.S	19	7	26	June 7		2
Private	A. H. Durbur	C	19	7	26	Aug. 9		1
Private	T. Arias	I	19	7	26	Oct. 27		
Private	S. A. Johnson	A	21	5	26	June 14		
Private	F. C. Wickes	B	7	18	25	June 7		1
Private	C. I. Peoble	D	11	14	25	June 14		
Captain	T. F. Dillont	F	12	13	25	June 14		4
Corporal	C. B. Baker	D	12	13	25	June 14		1
Sergeant	P. M. Calligan	C	13	12	25	June 14		1
Private	G. E. McClure	A	13	12	25	Aug. 9		
Private	F. R. Littlefield	B	13	12	25	Aug. 9		
Private	A. Herrmann	G	13	12	25	June 7		1
Private	A. J. Murray	G	13	12	25	Aug. 9		
Private	W. Flatten	K	13	12	25	June 7		2
Private	R. L. Scott	K	13	12	25	June 14		
Q. M. Sergt.	E. A. Haagansen	K	14	11	25	June 14		
Sergeant	W. P. Rae	G	14	11	25	June 7		4
Private	J. M. Fisher	A	14	11	25	June 14		
Private	C. P. Cuddy	C	14	11	25	Aug. 9		
Private	O. Koch	D	14	11	25	Oct. 27		
Private	G. N. Weck	E	14	11	25	Aug. 9		1
Private	C. L. Bristol	G	14	11	25	Nov. 8	C. M. C.	
Private	W. H. Knight	I	14	11	25	Aug. 18		
First Lieut.	W. A. Brown	E	15	10	25	June 7		11
Corporal	C. A. Hornby	K	15	10	25	June 14		1
Private	G. W. Holt	D	15	10	25	June 14		
Private	C. F. Taylor	D	15	10	25	Aug. 9		1
Private	E. J. McInerry	G	15	10	25	June 14		1
Private	T. F. Dean	K	15	10	25	Nov. 8	C. M. C.	
First Lieut.	L. M. Reed, Com.	Staff	16	9	25	Aug. 9		
First Lieut.	J. T. Jennings	B	16	9	25	June 7		9
Second Lieut.	R. S. Copeland	C	16	9	25	June 14		1

THIRTEENTH REGIMENT—*(Concluded).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	C. J. Moore	B	16	9	25	Nov. 8	C. M. C.	....
Private	Wm. Cottrill	D	16	9	25	Oct. 27	.....	1
Private	C. T. Williams	G	16	9	25	June 7	.....	1
Private	G. Dalgun	I	16	9	25	June 7	.....	....
Private	E. B. Quinn	K	16	9	25	June 14	.....	....
Sergeant	H. E. Kinkel	B	17	8	25	June 14	.....	1
Corporal	D. S. Green	C	17	8	25	Oct. 27	.....	....
Private	S. E. Belcher	A	17	8	25	Nov. 8	C. M. C.	....
Private	J. S. Doyle	B	17	8	25	Nov. 8	C. M. C.	1
Private	H. W. Mott	D	17	8	25	June 14	.....	....
Private	T. Bench	I	17	8	25	Oct. 27	.....	....
Private	L. J. Langrott	I	17	8	25	Aug. 9	.....	....
Private	S. E. Isaacson	E	18	7	25	June 7	.....	3
Private	A. A. Snellgrove	F	18	7	25	June 14	.....	....
Private	L. Case	H	18	7	25	Aug. 9	.....	....
Private	H. W. Styles	A	19	6	25	June 14	.....	1
Private	A. A. Holske	H	19	6	25	June 7	.....	3
Private	J. E. Slaughter	K	19	6	25	Aug. 9	.....	1
Private	W. H. Frickie	K	20	5	25	Aug. 9	.....	....

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FOURTEENTH REGIMENT.

(Figure of merit ..... 39.01.)

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	Jas. McHenry*	C	23	24	47	Aug. 6	C. M. C.	....
Second Lieut.	C. C. Wallace *	I	21	24	45	June 18	C. M. C.	2
First Lieut	*Hassell Nutt** (Com.)	Staff	19	23	42	June 30	.....	12
Private	J. H. LaCroix*	I	23	19	42	Sept. 13	C. M. C.	3
Private	Geo. Buhler	A	21	19	40	June 30	.....	3
Sergeant	G. H. Abrams	I	22	18	40	Sept. 1	.....	2
Private	Geo. Breining	I	19	20	39	June 30	.....	2
Sergeant	A. J. Main	F	16	22	38	Sept. 1	.....	3
Captain	R. Cardona	I	19	18	37	June 30	.....	10
Private	J. L. Breining	I	19	18	37	June 30	.....	2
Corporal	P. J. Farrell	I	18	18	36	June 30	.....	3
Captain	J. J. Dixon	A	15	19	34	June 30	.....	10
Corporal	T. B. Chambers	E	16	18	34	Sept. 1	.....	2
Corporal	Chas. Osterberg	G	16	18	34	Sept. 1	.....	1
Private	J. Murphy	F	16	18	34	June 30	.....	....
Captain	W. V. Peacon	F	17	17	34	Nov. 10	.....	4
Corporal	L. J. Cardona	I	18	16	34	Oct. 29	C. M. C.	3
Captain	W. F. Morris	K	13	20	33	June 30	.....	9
Sergeant	F. H. Stephenson	A	15	18	33	Oct. 15	C. M. C.	2
Corporal	Wm. Mahler	E	16	17	33	Sept. 1	.....	1
Captain	John Cutts	H	19	14	33	Sept. 1	.....	9
Private	A. Moore	H	15	17	32	June 30	.....	7
Sergeant	John Henwood	A	19	13	32	Sept. 1	.....	11
Corporal	D. H. Hange	G	20	12	32	Sept. 1	.....	5
Private	J. H. Foote	B	12	19	31	Sept. 1	.....	1
First Lieut	G. H. Rice	A	14	17	31	Sept. 1	.....	2
Second Lieut.	G. Lloyd	E	14	17	31	Sept. 1	.....	1
First Lieut.	A. Barnie, Jr. (Q. M.)	Staff.	15	16	31	Sept. 1	.....	5
Major	I. F. Atwood (Surg)	Staff.	16	15	31	June 30	.....	....
Q. M. Sergt.	G. R. Jennings	E	16	15	31	Sept. 1	.....	1

FOURTEENTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	SCORES.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Sergeant	L. Reeves	K	16	15	31	Sept. 1		1
Private	G. P. Eldridge	C	16	15	31	Sept. 1		
Private	M. Wekstrom	G	16	15	31	June 30		
Corporal	E. Buys	C	17	14	31	June 30		
Corporal	C. L. Holmberg	G	17	14	31	June 30		2
Private	B. Thrall	I	12	18	30	June 30		1
Sergeant	G. W. Granger	I	15	15	30	Sept. 1		2
Corporal	T. P. Gaine	B	15	15	30	Sept. 1		1
First Sergt	E. W. Castell	D	17	13	30	Sept. 1		
Q. M. Sergt	R. T. Mitchell	B	18	12	30	June 30		3
Private	J. J. Donoughoe	I	18	12	30	Sept. 1		2
Private	G. A. Keating	B	19	11	30	Sept. 1		3
Private	J. W. Broadbent	H	19	11	30	Sept. 1		
First Lieut	A. B. Campbell (Adj.)	Staff.	20	10	30	Oct. 1	C. M. C.	3
Sergt. Major	W. C. Noble	N.C.S	9	20	29	June 30		9
Private	C. A. Jackson	F	12	17	29	June 30		
Major	J. McNeil	Field	13	16	29	June 30		3
First Lieut	A. E. Steers	K	16	13	29	June 30		1
Q. M. Sergt	Edi Paur	K	17	12	29	Sept. 1		
Corporal	F. Prendergast	A	19	10	29	Sept. 1		2
Private	H. J. McDermott	K	10	18	28	June 30		
Sergeant	J. P. McNamara	C	12	16	28	June 30		4
Private	G. B. Wheeler	E	12	16	28	June 30		
Captain	J. M. White	B	13	15	28	June 30		11
Private	C. A. Caulberg	G	13	15	28	Sept. 1		
First Lieut	A. L. Kline	D	14	14	28	June 30		4
Private	M. J. McNamara	C	14	14	28	Sept. 1		
First Sergt	C. A. Gilligan	B	15	13	28	Sept. 1		1
Private	W. H. O. Greene	D	15	13	28	Sept. 1		
Private	F. E. Bockelman	I	15	13	28	Sept. 1		1
Private	J. F. Boyce	A	16	12	28	June 30		
Private	E. J. Cammer	B	16	12	28	June 30		
Private	J. H. Gillespie	K	16	12	28	June 30		
First Sergt	K. R. Fosburg	G	17	11	28	Sept. 1		3
Private	J. M. Budges	K	17	11	28	Sept. 1		
Captain	F. LeRoy Tetamore (Ast. S.)	Staff.	18	10	28	June 30		8
Private	A. F. Trabant	A	18	10	28	Sept. 1		2
Private	W. Marsh	D	12	15	27	Sept. 1		
Private	J. J. Besmer	H	13	14	27	Sept. 1		1
Private	J. L. McCue	K	13	14	27	Sept. 1		
Corporal	G. H. Cummings	K	14	13	27	Sept. 1		
First Lieut	W. R. Owens	H	15	12	27	Sept. 1		1
Sergeant	F. J. Hoerl	F	15	12	27	June 30		8
Private	W. J. O'Connell	F	15	12	27	Sept. 1		
Corporal	J. J. Bergen	K	16	11	27	Sept. 1		
Sergeant	C. F. Anderson	G	18	9	27	Sept. 1		1
Private	F. J. Mackey	B	18	9	27	June 30		
Private	T. G. Gow	K	18	9	27	Sept. 1		
Private	C. F. Thoms	A	19	8	27	Sept. 1		2
Corporal	E. J. Tugman	D	20	7	27	Sept. 1		
Private	W. H. Hyatt	H	9	17	26	Sept. 1		
Private	A. G. Foote	B	11	15	26	June 30		1
Sergeant	H. J. Ward	K	13	13	26	Sept. 1		
Private	A. A. Peabody	A	13	13	26	Sept. 1		
Private	D. K. Sprague	A	13	13	26	June 30		
Q. M. Sergt	Chas. Ahlen	A	14	12	26	Sept. 1		2
Corporal	J. B. Perez	F	14	12	26	June 30		
Private	W. J. Flynn	F	14	12	26	June 30		1
Corporal	G. W. Vernon	C	15	11	26	June 30		2
Private	L. A. Perez	F	15	11	26	June 30		
Private	A. S. Hooper	I	15	11	26	June 30		5
Private	W. H. Campbell	K	15	11	26	Sept. 1		
Corporal	S. W. Haff	K	16	10	26	Sept. 1		1
Sergeant	John Crawford (L. G. G.)	N.C.S	17	9	26	Sept. 1		4
Corporal	Thos. Kilfoil	A	17	9	26	June 30		2
Private	O. Lundguist	G	17	9	26	June 30		2
Private	W. H. Bonner	H	17	9	26	Sept. 1		
Private	H. C. Carney	K	17	9	26	Sept. 1		
First Lieut	A. O. Crane	I	18	8	26	June 30		8
Private	J. C. Cole	I	18	8	26	June 30		4

FOURTEENTH REGIMENT — *(Concluded).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Sergeant	J. C. Hart	A	20	6	26	Sept. 1		
Private	J. P. McGrath	F	12	13	25	June 30		
Private	W. J. Crosier	K	12	13	25	Sept. 1		
Private	M. Oriol	K	12	13	25	Sept. 1		2
Sergeant	W. J. Mullen	K	13	12	25	Sept. 1		
Corporal	W. G. Chambers	D	13	12	25	Sept. 1		
Private	J. J. Baldwin	D	13	12	25	June 30		
Private	M. S. Hayes	F	13	12	25	Sept. 1		
Private	J. Griffin	C	14	11	25	Sept. 1		
Private	J. W. Fredericks	D	14	11	25	June 30		
Private	A. A. Squire	H	14	11	25	June 30		1
Private	P. Archard	K	14	11	25	Sept. 1		
Private	S. H. Mellor	C	15	10	25	June 30		
Corporal	J. D. Crawford	F	16	9	25	Sept. 1		
Colonel	H. W. Mitchell	F	17	8	25	Sept. 1		8
Captain	B. S. Steen	C	17	8	25	Sept. 1		3
First Lieut	T. D. Henry	F	17	8	25	Sept. 1		2
Sergeant	J. F. Fogerty	D	17	8	25	Sept. 1		
Sergeant	Jos. Smith	K	17	8	25	Sept. 1		
Private	J. H. Lennon	D	17	8	25	Sept. 1		
Private	W. C. Riesenstahl	F	19	6	25	Sept. 1		1
Private	H. B. Mott	K	20	5	25	June 30		

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TWENTY-THIRD REGIMENT.

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Lieutenant	W. P. Pickett*	B	23	25	48	Sept. 14	State match	6
Private	S. C. Pirie*	I	24	24	48	June 18	M. B.	2
Lieutenant	G. F. Hamlin*	I	22	25	47	F. M.	Brigade	3
Lieutenant	J. S. Shepherd*	D	22	25	47	F. M.	State match	8
Sergeant	W. A. Stokes*	I	23	24	47	F. M.	A. C.	3
Sergeant	F. A. Wells*	B	23	24	47	Nov. 8	M. B.	9
Corporal	H. D. Hamilton*	I	21	25	46	Aug. 6	M. B.	3
Private	George Ball*	F	22	24	46	Aug. 13	M. B.	2
Private	L. J. Elliott*	C	22	24	46		State match	8
Captain	F. L. Holmes*	I	22	24	46	F. M.	A. C.	5
I. R. P.	W. H. Greenland*	Staff	22	24	46	Nov. 8	M. B.	7
Sergeant	W. A. Robinson*	A	23	23	46	Aug. 6	M. B.	6
Private	G. S. Scott*	A	23	23	46	July 16	M. B.	2
Captain	*Ezra DeForest**	C	23	23	46	Aug. 13	M. B.	12
Sergt. Major	A. D. Beeken*	N.C.S	20	25	45	F. M.	A. C.	7
Private	G. P. Brower*	B	21	24	45	Aug. 6	M. B.	
Corporal	F. T. Cooke*	I	22	23	45	July 4	M. B.	2
Ord. Sergt	*C. E. Bryant**	N.C.S	20	24	44	Oct. 1	M. B.	12
Lieutenant	Richard Oliver*	Staff	21	23	44	Aug. 13	M. B.	3
Lieutenant	A. C. Saunders*	K	21	23	44	Aug. 6	M. B.	10
Private	T. H. Barnard*	F	21	23	44	Aug. 13	M. B.	2
Corporal	E. V. Howard*	I	21	23	44	July 4	M. B.	2
Sergeant	H. P. Fowler*	F	19	24	43	Aug. 13	M. B.	6
Private	A. G. Findlay, Jr*	G	20	23	43	July 30	M. B.	1
Lieutenant	J. T. Hull*	F	21	22	43	June 11	M. B.	2
Corporal	H. Graff*	B	21	22	43	May 28	M. B.	4
Private	P. Kenyon*	G	21	22	43	Oct. 29	M. B.	1
Captain	*W. L. Candee**	B	22	21	43	Sept. 14	A. C.	12
Private	E. F. M. Wendelstadt*	C	23	20	43	July 4	M. B.	
Lieutenant	G. A. Williams*	H	18	24	42	June 18	M. B.	6

TWENTY-THIRD REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualification.
			200 yards.	500 yards.	Total.			
Corporal	W. C. Holmes*	B	19	23	42	June 11	M. B.	6
Corporal	F. I. Perry*	I	19	23	42	Aug. 27	M. B.	3
Private	I. E. Winslow*	C	19	23	42	July 30	M. B.	2
Private	W. N. Griffith, Jr*	E	19	23	42	June 18	M. B.	....
Sergeant	A. S. Gombers*	K	20	22	42	July 30	M. B.	8
Sergeant	T. W. Singleton*	I	20	22	42	June 11	M. B.	3
Private	R. Findlay*	G	20	22	42	July 30	M. B.	2
Private	H. P. Hildreth*	K	20	22	42	May 24	.....	10
Private	W. A. Hockemeyer*	I	21	21	42	Aug. 6	M. B.	1
Corporal	J. F. Steir*	I	22	20	42	Nov. 8	M. B.	2
Private	W. F. Townsend*	I	22	20	42	July 4	M. B.	2
Corporal	C. E. Graff	B	19	22	41	May 28	M. B.	4
Private	J. A. Smith	D	22	19	41	Aug. 13	M. B.	2
Private	R. B. Dawsen	I	20	20	40	Oct. 29	M. B.	....
Private	R. D. Melick	I	20	20	40	May 23	.....	2
Corporal	P. H. Worth	A	17	22	39	June 11	M. B.	3
Corporal	C. B. Hubbell	A	18	21	39	June 18	M. B.	5
Private	W. E. Johnson	B	18	21	39	Aug. 22	.....	....
Private	G. A. Barnett	B	20	19	39	Aug. 22	.....	1
Private	W. A. Green	A	18	20	38	Aug. 27	M. B.	2
Private	T. J. Hand	C	18	20	38	May 24	.....	1
Private	W. W. Holt	B	18	20	38	Nov. 8	M. B.	2
Corporal	C. S. Carscallen	I	19	19	38	May 23	.....	2
Sergeant	F. B. Van Doorn	N.C.S	20	18	38	May 23	.....	9
Sergeant	A. B. Thomas	K	20	18	38	June 11	M. B.	1
Lieutenant	T. W. Sillcocks	G	18	19	37	May 24	.....	6
Private	W. J. Savoye	F	19	18	37	Aug. 13	M. B.	....
Sergeant	H. L. Waldo	G	20	17	37	Aug. 22	.....	....
Private	A. H. Muller	A	15	21	36	Aug. 27	M. B.	3
Private	J. S. Barndollar	B	17	19	36	Nov. 8	M. B.	4
Sergeant	F. G. Dennington	H	19	17	36	May 23	.....	1
Private	E. B. Thurber	A	19	17	36	June 18	M. B.	2
Private	H. Dietrich	C	14	21	35	May 24	.....	....
Sergeant	J. N. Wheeler	I	15	20	35	May 23	.....	2
Private	W. E. Douglas	I	15	20	35	May 23	.....	2
Private	J. J. Shanks	K	15	20	35	Aug. 27	M. B.	2
Corporal	W. H. Arnold	K	16	19	35	May 23	.....	2
Private	G. B. Adams	G	16	19	35	May 24	.....	2
Private	C. E. Esterbrook	E	16	19	35	Oct. 15	M. B.	....
Private	W. S. Cassidy	H	16	19	35	July 30	M. B.	2
Private	H. Van Winkle	F	17	18	35	May 24	.....	2
Private	W. E. Herd	H	17	18	35	Oct. 1	M. B.	1
Private	J. M. Brooks	I	18	17	35	July 4	M. B.	1
Private	J. L. Phillips	I	18	17	35	June 16	.....	2
Private	G. M. Bennett	I	18	17	35	July 4	M. B.	2
Private	J. S. Mesecrole	A	19	16	35	Oct. 15	M. B.	2
Private	C. T. Bingham	E	19	16	35	Aug. 22	.....	....
Private	R. M. Buttle	D	20	15	35	May 23	.....	2
Private	Sol. Gomez	B	21	14	35	Oct. 15	M. B.	....
Corporal	G. C. Travis	K	13	21	34	May 24	.....	1
Lieutenant	G. W. Middleton	I	14	20	34	Nov. 8	M. B.	3
Corporal	G. F. A. Bondies	D	15	19	34	May 23	.....	4
Captain	B. C. Thorn	F	16	18	34	Aug. 13	M. B.	3
Sergeant	J. D. A. Onderdonk	B	16	18	34	May 23	.....	9
Private	E. H. Esterbrook	E	16	18	34	May 24	.....	....
Corporal	W. G. Ten Eyck	H	16	18	34	May 23	.....	3
Private	M. F. Cook	K	16	18	34	May 23	.....	3
Private	Jos. M. Carrere	A	17	17	34	May 24	.....	3
Private	O. R. Anderson	E	18	16	34	Aug. 9	.....	1
Private	A. J. Constantine, Jr	D	18	16	34	May 23	.....	2
Private	J. W. Adams	H	18	16	34	May 23	.....	3
Private	H. A. Rodrique	B	19	15	34	Nov. 10	.....	....
Surgeon	W. E. Spencer	Staff.	13	20	33	May 23	.....	8
Private	C. G. Tinker	I	20	13	33	May 23	.....	1
Private	F. Sears	G	19	14	33	May 24	.....	1
Private	R. W. King	F	19	14	33	May 24	.....	1
Private	W. B. Young	A	19	14	33	Oct. 15	M. B.	1
Asst. Surgeon	H. L. Cochran	N.C.S	19	14	33	May 23	.....	2
Private	J. B. DeMott	F	18	15	33	May 24	.....	....
Private	B. H. Smith	A	18	15	33	June 18	M. B.	....

TWENTY-THIRD REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	A. R. Fullerton	A	18	15	33	May 24		
Private	W. S. Huston	H	18	15	33	Aug. 27	M. B.	1
Private	F. T. Aldridge	K	18	15	33	June 11	M. B.	5
Private	J. L. Bradlee	H	17	16	33	Aug. 22		
Private	R. Lounsbery	K	17	16	33	June 12	M. B.	4
Private	C. H. S. Jaffray	I	17	16	33	May 23		2
Private	H. S. Clark	K	17	16	33	Nov. 8	M. B.	
Lieut. & Adj't.	E. W. Burd	Staff.	17	16	33	Oct. 29	M. B.	10
Private	J. M. Vose	C	16	17	33	Oct. 29	M. B.	
Private	P. S. Swain	A	16	17	33	Aug. 22		
Private	W. E. Young	I	16	17	33	July 4	M. B.	
Corporal	E. A. Brush	G	16	17	33	Aug. 22		
Private	A. Leavens	F	15	18	33	May 24		2
Private	W. A. Wiese	A	14	19	33	Aug. 22		
Private	H. M. Field	F	11	21	32	Nov. 8	M. B.	
Private	F. W. Quereau	B	13	19	32	Oct. 29	M. B.	3
Sergeant	R. McCollins	F	14	18	32	Aug. 27	M. B.	
Private	R. N. Hunter	E	14	18	32	July 4	M. B.	1
Private	F. L. Sparks	H	14	18	32	Nov. 8	M. B.	
Corporal	C. J. Fisher	G	15	17	32	June 11	M. B.	5
Private	W. H. Meeteer	I	15	17	32	May 23		
Private	J. E. Shiff	D	15	17	32	June 18	M. B.	2
Corporal	T. W. Cavanagh	C	16	16	32	May 23		3
Private	F. A. Wilson	A	16	16	32	Oct. 15	M. B.	2
Private	F. W. Coddington	I	16	16	32	May 23		
Private	T. H. Story	H	16	16	32	Aug. 27	M. B.	
Sergeant	W. H. Handy	I	17	15	32	July 4	M. B.	2
Private	M. Sparks	I	17	15	32	Oct. 15	M. B.	2
Corporal	G. H. Taylor	F	17	15	32	July 4	M. B.	3
Corporal	W. B. T. Ronalds	K	17	15	32	May 23		1
Private	George Barley	I	17	15	32	May 23		1
Private	H. Bunker	C	17	15	32	May 23		1
Private	Nic. Bolet	B	17	15	32	Aug. 22		
Private	C. D. Bartholemew	A	17	15	32	Nov. 8	M. B.	
Corporal	W. G. Kimball	A	18	14	32	May 24		3
Private	C. W. Andrus	H	18	14	32	Aug. 27	M. B.	
Private	J. R. Clarke	C	18	14	32	Oct. 15	M. B.	
Private	L. L. Quereav	B	18	14	32	Nov. 8	M. B.	1
Private	G. A. Hatch	D	18	14	32	Nov. 8	M. B.	4
Private	G. S. Titus	D	18	14	32	May 23		1
Sergeant	A. Eldredge	C	19	13	32	May 24		1
Private	F. S. Cowperthwait	H	19	13	32	June 11	M. B.	3
Private	C. Von Tootha	D	19	13	32	July 30	M. B.	
Private	M. Avtonsanti	K	19	13	32	Nov. 8	M. B.	
Private	D. K. Case	K	20	12	32	Nov. 8	M. B.	
R. G. G.	H. M. Peckham	N.C.S	20	12	32	Aug. 22		2
Private	Jos. Walker	K	20	12	32	Nov. 8	M. B.	
Private	G. W. Mott	D	21	11	32	Aug. 22		1
Private	J. S. Garrison	F	12	19	31	May 24		
Lieutenant	W. H. B. Smith	A	13	18	31	June 18	M. B.	
Sergeant	E. Morris	A	13	18	31	May 24		
Private	C. E. Hubbard	H	13	18	31	Oct. 29	M. B.	
Private	E. M. Quereav	B	13	18	31	May 23		2
Private	C. D. Napier	A	13	18	31	May 24		
Corporal	H. L. Bartlett	B	14	17	31	May 23		3
Private	John M. Douglass	I	14	17	31	May 23		2
Sergeant	W. P. Blackman	C	15	16	31	May 24		5
Sergeant	J. P. Mulford	E	15	16	31	May 24		7
Corporal	H. Greenman	F	15	16	31	May 24		2
Corporal	W. F. Forby	B	15	16	31	Aug. 22		
Private	E. T. Fanning	I	15	16	31	Aug. 9		2
Private	G. W. Washburn	C	15	16	31	Aug. 22		
Sergeant	A. W. Schenck	F	17	14	31	June 18	M. B.	3
Corporal	G. E. Crook	G	17	14	31	May 24		1
Sergeant	W. H. Stone	K	18	13	31	June 11	M. B.	6
Corporal	W. L. King	D	18	13	31	May 23		2
Corporal	E. T. J. Mostert	C	18	13	31	May 24		2
Private	C. W. Ruby	G	18	13	31	Oct. 15	M. B.	7
Private	A. T. Morro	G	18	13	31	May 23		2
Private	S. J. Estey	G	18	13	31	July 4	M. B.	

TWENTY-THIRD REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualification.
			200 yards.	500 yards.	Total.			
Private	C. R. Wells	D	18	13	31	May 23		1
Private	C. B. Van Nostrand	A	18	13	31	June 11	M. B.	1
Private	A. S. Mitchell	I	18	13	31	May 23		2
Private	Wm. Burkhard	C	18	13	31	May 23		1
Private	H. Chichester	D	18	13	31	May 23		2
Private	R. A. Meyer	I	19	12	31	May 23		2
Private	G. B. Hopkins	C	13	17	30	May 24		1
Private	Guy Loomis	F	13	17	30	Nov. 8	M. B.	
Private	A. L. Tinker	F	13	17	30	May 24		1
Private	F. Wilson	H	13	17	30	Aug. 27	M. B.	
Sergeant	F. P. Tapley	F	14	16	30	July 4	M. B.	2
Private	N. King	G	14	16	30	May 24		3
Private	A. J. Bayer	B	14	16	30	May 23		1
Private	F. W. Barnaby	I	14	16	30	May 23		2
Private	A. D. S. Jackson	E	14	16	30	May 24		
Private	T. C. Benson	A	14	16	30	Nov. 8	M. B.	1
Private	L. W. Ropes	K	14	16	30	May 23		
Private	Alex. Von Moers	C	15	15	30	May 24		8
Sergeant	J. F. Handy	I	16	14	30	June 11	M. B.	2
Private	J. N. Burke	I	16	14	30	Aug. 6	M. B.	1
Private	J. L. Brumley, Jr.	B	16	14	30	Aug. 22		
Private	L. Brueninghausen	B	16	14	30	Nov. 8	M. B.	
Private	C. F. Grandeman	D	16	14	30	Nov. 8	M. B.	
Private	H. D. Schoonmaker	F	16	14	30	May 24		
Private	J. A. Mackinnon	K	16	14	30	Aug. 22		
Private	F. B. De La Vergne	E	17	13	30	Oct. 29	M. B.	1
Private	Jos. Frohlich	G	17	13	30	May 24		
Private	E. Hiler	C	17	13	30	Oct. 15	M. B.	
Private	S. M. Wood	H	18	12	30	Aug. 22		1
Private	B. R. Suydam	G	18	12	30	Aug. 13	M. B.	1
Private	C. W. F. Sproul	K	18	12	30	May 23		
Sergeant	C. A. Frost	N.C.S	19	11	30	May 23		11
Private	J. N. R. Bryant	H	19	11	30	Nov. 8	M. B.	2
Private	C. H. Kentgen	A	19	11	30	June 11	M. B.	4
Private	A. D. Seaver	F	19	11	30	May 24		
Private	A. Marian	B	19	11	30	Aug. 13	M. B.	1
Surgeon	E. A. Lewis	Staff	20	10	30	May 23		7
L. G. G.	H. L. Hall	N.C.S	20	10	30	May 23		3
Private	C. E. Lee	H	22	8	30	May 23		1
Private	E. H. Frothingham	A	9	20	29	July 4	M. B.	
Private	R. B. Mather	A	10	19	29	June 11	M. B.	2
Corporal	W. H. Bradley	F	12	17	29	May 24		2
Private	E. H. Benedick	I	12	17	29	May 23		1
Private	C. E. Nelson	D	13	16	29	June 11	M. B.	5
Private	J. H. Evans	A	13	16	29	July 4	M. B.	3
Private	N. S. Carner	E	13	16	29	May 24		4
Private	R. D. DeMund	D	13	16	29	June 11	M. B.	3
Private	W. E. Matthews	A	13	16	29	Oct. 15	M. B.	
Private	Chas. F. Burke	I	13	16	29	June 16		1
Private	C. A. De La Mesa	H	13	16	29	May 23		1
Corporal	W. B. Tiebout	B	14	15	29	May 23		5
Private	F. T. Jervis	I	14	15	29	June 30		2
Private	L. McRobbie	F	14	15	29	May 24		
Private	A. E. Letson	H	14	15	29	May 23		
Sergeant	G. H. Thomas	N.C.S	15	14	29	May 23		2
Corporal	A. S. Orchard	D	15	14	29	May 23		2
Corporal	C. W. Kayser	C	15	14	29	Aug. 27	M. B.	3
Private	W. G. Hull	F	15	14	29	June 11	M. B.	2
Private	J. C. Vanderveer	I	15	14	29	June 16		2
Private	J. F. Henry, Jr.	A	15	14	29	June 11	M. B.	1
Private	A. E. Pooke	C	15	14	29	June 11	M. B.	
Private	G. Reed	I	15	14	29	May 23		
Lieutenant	J. De W. Clark	E	16	13	29	May 24		11
Sergeant	W. M. Despard	G	16	13	29	Aug. 22		
Sergeant	R. F. O. Frickenhavs	A	16	13	29	May 24		5
Private	W. B. Gray	C	16	13	29	Aug. 22		1
Private	P. F. Higgs	A	16	13	29	Aug. 22		
Private	G. W. Seixas	D	16	13	29	May 23		2
Private	E. B. Strout	C	16	13	29	May 24		1
Lieutenant	A. A. Thompson	Staff	17	12	29	May 24		6

TWENTY-THIRD REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	R. A. Fordham	I	17	12	29	May 23		2
Private	C. Haas	A	17	12	29	June 11	M. B.	
Private	C. L. Scofield	H	17	12	29	July 30	M. B.	
Private	G. B. Bretz	A	17	12	29	June 18	M. B.	2
Private	H. McK. Tolar	A	18	11	29	July 30	M. B.	2
Private	B. Towt	E	18	11	29	Nov. 8	M. B.	
Private	J. J. Langa	D	18	11	29	May 23		1
Private	W. Foster	K	18	11	29	Aug. 22		1
Private	J. M. Ellie	I	18	11	29	Nov. 8	M. B.	
Sergeant	W. B. Despard	N.C.S	19	10	29	May 23		9
Corporal	H. B. Shute	I	19	10	29	May 23		2
Private	F. W. Walford	C	10	18	28	June 18	M. B.	
Private	C. M. Burt	K	11	17	28	Nov. 8	M. B.	
Lieutenant	E. J. Kraft	D	12	16	28	May 23		7
Private	W. P. Boggs	C	12	16	28	June 18	M. B.	1
Private	J. W. Sweeney	D	13	15	28	May 23		10
Private	C. F. Weigandt	I	13	15	28	May 23		
Private	E. P. Merrill	I	13	15	28	June 30		2
Private	G. A. Annable	E	13	15	28	June 11	M. B.	
Private	G. A. Stohlman	C	13	15	28	Aug. 22		2
Private	T. C. Treadwell	B	13	15	28	May 23		
Private	C. E. Husted	I	14	14	28	June 16		1
Private	A. L. Mason	A	14	14	28	June 11	M. B.	
Private	C. C. Bowen	A	14	14	28	Nov. 8	M. B.	
Private	W. R. Cummins	E	14	14	28	May 24		
Private	G. C. Hicks, Jr	E	14	14	28	May 24		
Private	H. F. Wheeler	C	14	14	28	May 24		1
Private	W. A. Bayer	B	14	14	28	May 23		4
Private	H. G. Wiley	I	15	13	28	Oct. 15	M. B.	1
Private	L. W. Kimball	H	15	13	28	Aug. 27	M. B.	1
Private	R. R. Orchard	D	15	13	28	May 23		
Private	F. C. Martin	D	15	13	28	Nov. 8	M. B.	1
Private	H. Britton	D	15	13	28	Nov. 8	M. B.	1
Private	H. C. Barthman	K	15	13	28	May 23		
Major	C. E. Waters	Field	16	12	28	May 24		9
Lieutenant	R. T. Holly	F	16	12	28	May 24		3
Sergeant	Q. C. De Grove	G	16	12	28	Aug. 22		1
Private	De W. C. Weld	A	16	12	28	June 11	M. B.	
Private	A. D. Raymond	A	16	12	28	Aug. 13	M. B.	
Private	W. C. Hough	A	16	12	28	Oct. 15	M. B.	3
Private	J. W. Mason, Jr	F	16	12	28	May 24		1
Private	W. R. Willson	C	17	11	28	Oct. 15	M. B.	2
Sergeant	G. A. Turnbull	D	17	11	28	May 23		5
Private	F. A. Martin	I	17	11	28	May 23		2
Private	A. M. Boucher	I	17	11	28	June 6		
Private	E. M. Grout	A	17	11	28	July 4	M. B.	
Private	C. B. Easton	C	17	11	28	Aug. 22		
Private	P. H. Cross	K	17	11	28	May 24		2
Private	E. S. Turner	I	18	10	28	June 11	M. B.	2
Private	A. S. Robinson	I	18	10	28	Aug. 22		2
Private	Barry Mines	F	18	10	28	May 24		
Private	W. H. Hoople, Jr	F	18	10	28	May 24		
Private	H. N. Gates	D	18	10	28	May 23		
Corporal	C. B. Denny	A	8	20	28	May 23		
Private	C. R. Bostwick	B	19	9	28	June 18	M. B.	
Private	C. D. Hubbard	K	19	9	28	June 11	M. B.	
Private	E. F. Allen	F	9	18	27	May 24		
Private	A. C. Soper	E	9	18	27	May 24		
Private	A. L. Boucher	I	9	18	27	June 16		
Private	C. N. Leach	I	9	18	27	Aug. 9		
Private	De W. C. Squires	I	9	18	27	July 4	M. B.	
Sergeant	C. P. Duffee	A	10	17	27	Aug. 13	M. B.	
Private	H. H. Henrici	I	10	17	27	Aug. 6	M. B.	2
Private	H. E. Goedecke	F	10	17	27	Aug. 27	M. B.	
Private	F. J. Cole	I	11	16	27	June 30		2
Private	E. M. Taylor	C	11	16	27	May 24		
Private	E. L. Magnus	B	11	16	27	May 23		2
Private	Wm. Nicholson	B	11	16	27	May 23		
Private	G. H. Grapel	K	11	16	27	May 24		2
Lt. Colonel	A. C. Smith	H	12	15	27	July 30	M. B.	6

TWENTY-THIRD REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Lieutenant	George E. Hall	G	12	15	27	June 14		
Corporal	W. S. Woodrow	A	12	15	27	May 24		1
Private	E. H. Wheeler	F	12	15	27	May 24		
Private	M. Hartwigson	E	12	15	27	Aug. 22		
Private	C. L. Coleman	B	12	15	27	July 4	M. B.	2
Lieutenant	C. R. Silkman	C	13	14	27	May 24		1
Private	C. B. Upjohn	I	13	14	27	June 30		1
Private	P. H. Edwards	E	13	14	27	Aug. 22		1
Private	W. M. Pye	E	13	14	27	Nov. 8	M. B.	
Private	T. F. Smith	I	13	14	27	July 30	M. B.	1
Private	E. Dodge	F	13	14	27	May 24		1
Private	F. H. Norton	F	13	14	27	May 24		1
Private	E. F. Hogg	F	13	14	27	Nov. 8	M. B.	
Private	S. G. Lane	B	13	14	27	May 23		
Captain	H. L. Crane	B	14	13	27	May 24		3
Sergeant	G. T. Musson	K	14	13	27	May 23		11
Private	G. B. Adams	B	14	13	27	May 23		1
Private	H. B. Dormon	A	14	13	27	July 4	M. B.	2
Private	S. W. Northridge	C	14	13	27	May 23		
Private	G. T. Johnson	C	14	13	27	Nov. 8	M. B.	
Private	T. W. Arnold	C	14	13	27	May 24		2
Private	T. Norton, Jr.	F	14	13	27	May 24		
Private	H. M. Robinson	H	14	13	27	Aug. 13	M. B.	
Captain	H. C. Everdell	A	15	12	27	June 18	M. B.	4
Sergeant	C. G. Todd	K	15	12	27	May 28	M. B.	5
Corporal	W. McK. Chapman	H	15	12	27	Aug. 22		3
Private	W. F. Pemsey	I	15	12	27	June 30		2
Private	L. W. Willets	E	15	12	27	Aug. 27	M. B.	
Private	J. B. Hodgskin	I	15	12	27	Sept. 2		
Private	G. B. Glover	H	15	12	27	May 23		
Corporal	W. J. H. Boyd	I	16	11	27	May 23		
Corporal	W. J. Macveety	E	16	11	27	May 28	M. B.	
Private	W. D. C. Field	A	16	11	27	Aug. 27	M. B.	2
Private	J. W. Raymond	I	16	11	27	Aug. 8	M. B.	
Private	O. A. Renne	G	16	11	27	May 23		
Private	W. F. Sniffen	H	16	11	27	May 23		
Private	E. V. Paxton	D	16	11	27	May 23		2
Private	D. B. Cole	B	16	11	27	May 23		
Sergeant	C. E. Elford	E	17	10	27	June 11	M. B.	2
Private	L. J. Prager	A	17	10	27	May 24		1
Private	H. J. Beers	E	17	10	27	Aug. 22		
Private	P. P. Pope	B	17	10	27	May 23		
Private	C. Britton	D	17	10	27	May 23		2
Private	C. B. Coates	I	19	8	27	June 6		1
Private	G. R. Wiggins	G	19	8	27	Oct. 15	M. B.	
Private	R. A. Law	I	19	8	27	May 23		
Private	W. L. Morehouse	I	20	7	27	June 6		1
Sergeant	Jos. Brewster	B	6	20	26	May 23		
Private	Wm. F. De Nyse	C	9	17	26	May 24		6
Private	D. Woodcock	K	9	17	26	Nov. 8	M. B.	
Private	W. G. Wing	A	10	16	26	Oct. 29	M. B.	
Corporal	P. J. Laugler	D	11	15	26	May 23		2
Private	G. W. Douglass	B	11	15	26	May 23		
Private	C. R. Braine, Jr.	F	11	15	29	June 11	M. B.	2
Private	C. Bolet	K	11	15	26	Nov. 8	M. B.	
Private	R. H. McDonald	A	12	14	26	May 24		2
Private	W. P. Cook	H	12	14	26	May 23		1
Private	W. S. Sillcocks	G	12	14	26	May 24		1
Private	C. H. Bishop	G	12	14	26	Nov. 8	M. B.	
Private	A. W. Underhill	C	12	14	26	May 24		
Private	W. O. Jacquette	E	12	14	26	Aug. 27	M. B.	
Private	R. B. Constantine	A	12	14	26	Oct. 15	M. B.	
Lieutenant	W. S. Banta	C	13	13	26	May 24		6
Corporal	A. E. Flindt	F	13	13	26	May 24		1
Private	E. L. Miller	A	13	13	26	June 18	M. B.	2
Private	E. L. Speir	F	13	13	26	Aug. 22		
Private	H. R. Brewster	B	13	13	26	Aug. 22		2
Private	H. F. Barre	I	13	13	26	Aug. 9		2
Private	C. G. Scofield	H	13	13	26	July 4	M. B.	
Private	J. K. Caldwell	F	14	12	26	May 24		1

TWENTY-THIRD REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	C. F. Christensen	I	14	12	26	May 23		1
Captain	D. R. Aldridge	K	15	11	26	May 23		6
Corporal	G. M. Smith	F	15	11	26	May 24		
Private	H. Krause	A	15	11	26	June 11	M. B.	
Private	W. L. Burdell	H	15	11	26	Aug. 22		1
Private	Jos. Horn	E	15	11	26	Aug. 22		
Private	T. S. Perkins	A	15	11	26	June 11	M. B.	
Private	George W. Northridge	C	15	11	26	May 23		
Private	H. D. Abberley	D	15	11	26	Aug. 22		1
Sergeant	W. W. Davis	D	16	10	26	May 53		1
Private	J. H. Boynton	G	16	10	26	May 24		
Private	Thomas Ormiston	H	16	10	26	May 23		2
Private	C. H. Randebock	I	16	10	26	May 23		1
Private	A. B. Graves	A	16	10	26	May 24		
Sergeant	Charles Symons	H	17	9	26	May 23		
Private	C. A. Manning	I	17	9	26	May 23		2
Private	G. W. DeVor, Jr.	D	17	9	26	Aug. 22		3
Captain	F. C. Cochev	D	18	8	26	May 23		3
Private	A. B. Pouch	B	18	8	26	May 23		1
Private	H. B. Bierling	K	18	8	26	Oct. 15	M. B.	2
Private	F. A. Croker	K	18	8	26	Oct. 15	M. B.	2
Sergeant	B. Bangs	C	19	7	26	May 23	M. B.	3
Private	L. P. Towt	E	19	7	26	July 4		4
Private	C. D. Newman	A	19	7	26	May 24		2
Private	F. H. Gillett	I	20	6	26	May 23		1
Private	S. Keeler	G	7	18	25	June 30		
Private	F. M. Cowperthwait	H	8	17	25	June 11	M. B.	1
Sergeant	T. O. Callender	A	8	16	25	May 24		
Private	F. C. Morford	F	9	16	25	Aug. 22		
Corporal	T. J. Underhill	C	10	15	25	May 23		3
Corporal	A. A. Gorman	C	10	15	25	May 24		2
Private	F. L. Gray	C	10	15	25	Nov. 8	M. B.	
Private	R. B. Clayton	K	10	15	25	May 24	M. B.	
Private	F. N. Dewey	E	10	15	25	Nov. 8	M. B.	
Private	H. Montgomery	F	10	15	25	July 30	M. B.	
Private	C. Evans	D	10	15	25	Nov. 8	M. B.	1
Private	E. C. Osborn	H	11	14	25	May 23		1
Sergeant	R. H. Hurles	H	12	13	25	May 23		3
Private	W. A. Keeken	I	12	13	25	May 23		3
Private	F. H. Cordnan	E	12	13	25	May 24		
Private	T. J. Coffin	A	12	13	25	May 24		
Private	H. E. Sturtevant	F	12	13	25	Nov. 8	M. B.	2
Private	H. W. Burford	B	12	13	25	May 26		
Private	N. F. Farr	G	12	13	25	May 24		1
Private	E. Gorton	A	13	12	25	May 24		2
Private	R. F. Peet	F	13	12	25	May 24		1
Private	Evg. Boucher	I	13	12	25	May 23		
Lieutenant	W. A. Underhill	E	14	11	25	Aug. 27	M. B.	
Private	T. M. Close	B	14	11	25	Nov. 8	M. B.	
Private	J. J. Norris	C	14	11	25	May 24		7
Private	A. Standinger	A	14	11	25	May 24		2
Private	E. S. Walker	B	14	11	25	May 23		
Private	J. A. McCarthy	H	14	11	25	Nov. 8	M. B.	
Sergeant	E. J. Howatt	D	15	10	25	May 23		2
Sergeant	E. Haynes	G	15	10	25	May 24		5
Private	G. A. Boyden	I	15	10	25	May 23		3
Private	H. J. Bristow	A	15	10	25	May 22		
Captain	F. F. Haviland	A	16	9	25	May 24		2
Sergeant	H. C. Thorn	F	16	9	25	May 24		
Corporal	H. B. Tripp	E	16	9	25	July 4	M. B.	3
Private	J. Phayre	G	16	9	25	May 24		
Private	R. E. Whitney	D	16	9	25	May 23		2
Private	F. H. Mickleborough	F	16	9	25	Aug. 22		
Private	E. Mansfield	C	16	9	25	Aug. 22		
Captain	C. F. Guyon	E	17	8	25	June 11	M. B.	
Lieutenant	F. Dunderdale	E	17	8	25	Aug. 22		
Private	C. W. Booth	F	17	8	25	June 11	M. B.	2
Private	A. M. Franklin	C	18	7	25	May 24		
Private	A. W. King	F	18	7	25	May 24		1
Private	F. E. Steele	I	18	7	25	May 23		1

TWENTY-THIRD REGIMENT — *(Concluded).*

RANK.	Name.	Company.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	W. H. Wright	C	18	7	25	May 23		
Private	J. H. Ingraham	H	18	7	25	Nov. 8	M. B.	1
Private	De W. P. Dutcher	G	19	6	25	Aug. 22		
Private	W. H. Oldenberg	C	19	6	25	Oct. 29	M. B.	4
Private	R. H. Kimber	D	20	5	25	May 23		2

Total 456

THIRTY-SECOND REGIMENT.

(Figure of merit..... 39.97.)

RANK.	Name.	Company.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Sergeant	M. G. Schraeder	G	17	20	37	June 16		1
Captain	Edw. Verderkberg	D	19	18	37	June 16		7
Captain	Van D. Macumber (I.R.P.)	Staff	15	20	35	June 16		2
Captain	F. G. Winter (Asst. Sur.)	Staff	16	18	34	June 16		3
Private	A. Ludwig	A	16	18	34	June 16		
Private	A. Peter	B	12	21	33	Aug. 25		4
Corporal	P. Helig	B	16	17	33	June 16		1
Sergeant	H. J. Crowell (Col. B.)	N.C.S	17	16	33	June 16		1
Ord. Sergeant	Otto Langsdorf	N.C.S	20	13	33	June 16		10
Captain	G. H. Bishop	A	23	10	33	June 16		
Corporal	T. F. McManus	D	14	18	32	June 16		
Private	William Dayton	A	14	18	32	June 16		3
First Lieut	J. R. Teel (Q. M.)	Staff	16	16	32	June 16		1
Colonel	L. Finkelmeier	F	19	13	32	June 16		1
Private	Thomas Curran	A	19	13	32	Aug. 25		
Captain	W. F. Gratz	H	15	16	31	Oct. 15	C. M. C.	6
Second Lieut.	J. J. Elzenbeck	I	15	16	31	June 16		1
Corporal	George Evans	D	16	15	31	Aug. 25		1
First Lieut	W. Vander Clute, Jr. (Adj.)	Staff	17	14	31	June 16		8
Captain	J. J. Klein	G	13	17	30	June 16		11
Q. M. Sergt	J. C. McGlynn	A	16	14	30	June 16		1
Major	J. F. Valentine (Surg.)	Staff	18	12	30	June 16		8
Sergeant	William Feringer	B	18	12	30	June 16		4
Corporal	A. Hermann	H	18	12	30	June 16		1
Private	F. Stoss	B	18	12	30	June 16		
Second Lieut.	William Luthy	H	19	11	30	June 16		2
Sergt. Major	Jacob Manz, Jr.	N.C.S	21	9	30	Aug. 25		3
First Sergt	William Finkelmeier	I	21	9	30	Aug. 25		
Sergeant	J. W. York	A	16	13	29	June 16		1
Private	C. Wandelle	H	16	13	29	June 16		
Corporal	O. J. Brickford	A	18	11	29	June 16		1
Corporal	H. L. Hilbut	I	18	11	29	June 16		1
Private	Joseph Hart	K	18	11	29	Aug. 25		
Captain	E. Broggelworth	C	12	16	28	June 16		7
Sergeant	J. B. Dewitt	A	14	14	28	June 16		2
Private	John Schaffer	C	17	11	28	June 16		
First Sergt	L. R. Wood	A	14	13	27	Aug. 25		1
Corporal	Charles Ludwig	C	14	13	27	June 16		2
Private	B. F. Harrington	A	14	13	27	June 16		
Private	C. Boller	D	14	13	27	Aug. 25		
Private	L. Berhmann	K	14	13	27	June 16		
Private	L. Broder	K	14	12	27	Aug. 25		
Sergeant	E. A. Hatch (Hos. Stew.)	N.C.S	15	12	27	Aug. 25		1
Private	H. Fertz	D	15	12	27	Aug. 25		1
Private	Leo Schmidt	F	15	12	27	Aug. 25		

THIRTY-SECOND REGIMENT—*(Concluded).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Second Lieut.	E. J. McGlynn	A	16	11	27	Aug. 25		1
Captain	Charles W. Waage	F	17	10	27	Aug. 25		8
Major	F. W. Parisette	Field	18	9	27	June 16		9
Sergeant	Isaac Barnett	D	18	9	27	June 16		2
First Lieut	E. J. Renison	D	20	7	27	June 16		1
Private	William Hendel	G	13	13	26	June 16		1
Private	M. Carroll	H	13	13	26	June 16		
Private	M. Abrahams	K	13	13	26	June 16		
Sergeant	W. F. McDonough (L.G.G.)	N.C.S	14	12	26	Aug. 25		2
Private	F. Paul	I	14	12	26	June 16		
Second Lieut.	McBurger	K	15	11	26	June 16		
Q. M. Sergt.	John Denniger	G	15	11	26	June 16		1
Private	W. Boehm	C	15	11	26	June 16		2
Private	Wm. Wurz	G	15	11	26	June 16		
Private	F. Ebert	A	17	9	26	June 16		
Private	Wm. Harrison	G	17	9	26	June 16		1
Private	Wm. Zahnle	H	18	8	26	June 16		
Private	John Burcholz	I	18	8	26	June 16		2
Private	Robert Abesser	D	19	7	26	Aug. 25		
Private	John Rosenkranz	D	7	18	25	Aug. 25		
Private	Chas. Pabst	F	11	14	25	Aug. 25		
Private	Geo. Wagenheausser	F	11	14	25	June 16		
Sergeant	Wm. Lenfor	C	12	13	25	June 16		
First Lieut	W. D. Wood	A	13	12	25	June 16		2
Private	John Beckhans	C	13	12	25	June 16		1
Private	Wm. Winans	C	14	11	25	June 16		
Q. M. Sergt.	S. R. Richmond	F	15	10	25	Aug. 25		5
Sergeant	E. Pufahl	C	15	10	25	June 16		2
Sergeant	J. H. Newall	D	15	10	25	June 16		1
Sergeant	Jac. Palm	G	15	10	25	June 16		1
Private	Chas. Kulich	B	15	10	25	June 16		
Private	H. M. Franklin	K	15	10	25	June 16		
Second Lieut.	R. H. McKittrick	C	16	9	25	June 16		1
Q. M. Sergt.	A. Hoffman	K	16	9	25	June 16		1
Sergeant	F. A. Hunt	A	16	9	25	June 16		
Corporal	J. W. Cleary	A	16	9	25	June 16		1
Sergeant	Julius Flick	H	18	7	25	June 16		4

Total..... 82

FORTY-SEVENTH REGIMENT.

(Figure of merit..... 47.07.)

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	G. H. Frazer*	G	21	24	45	July 30	C. M. C.	2
First Sergt	B. R. Meserole*	A	22	22	44	June 18	C. M. C.	4
Private	W. G. Elliott*	G	20	23	43	Aug. 6	C. M. C.	1
Private	J. N. Freestone	F	20	21	41	May 20		1
Private	R. H. Harding	I	20	20	40	May 20		2
Q. M. Sergt.	F. E. Shipman	N.C.S	21	19	40	Aug. 27	C. M. C.	3
Second Lieut.	J. W. Barlow	I	20	19	39	May 20		2
First Sergt	R. H. Smith	K	20	18	38	May 20		2
First Lieut	J. B. Christoffel, Jr.	F	20	17	37	Sept. 5		8
Corporal	J. J. Dixon, Jr.	F	14	22	36	May 20		2
Corporal	G. W. Seaward	F	17	18	35	May 20		2
Private	John Shannon	K	17	18	35	May 20		
Com. Sergt.	G. S. Tuthill	N.C.S	19	16	35	May 20		4

FORTY-SEVENTH REGIMENT — *(Continued)*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
First Lieut...	W. C. Roe	D	20	15	35	May 20		....
Sergeant.....	P. Mead (L. G. G.)	N.C.S	16	18	34	May 20		2
Private.....	W. J. Kelly	I	17	17	34	Aug. 26		....
Captain.....	W. R. Pettigrew	G	18	16	34	May 20		5
Captain.....	*A. G. Brown* (I. R. P.)	Staff.	19	15	34	May 20		12
Captain.....	W. H. Eddy	I	20	14	34	May 20		9
First Lieut...	F. J. Vertizan	G	20	14	34	Aug. 13	C. M. C.	3
Sergeant.....	H. D. McCutcheon	K	20	14	34	May 20		1
Corporal.....	E. D. Strong	D	12	21	33	May 20		....
Sergeant.....	L. Morriz	I	15	18	33	May 20		1
Private.....	F. L. Palm	K	13	19	32	Aug. 26		....
Private.....	E. A. Nash	F	15	17	32	May 20		1
Corporal.....	T. F. Hobby	F	16	16	32	May 20		2
Private.....	H. M. Baker	I	16	16	32	May 20		2
Private.....	E. F. Barnes	A	17	15	32	May 20		1
Private.....	M. B. Maguire	I	17	15	32	June 30		....
First Sergt...	F. H. Hobby	F	18	14	32	May 20		4
Private.....	Thos. Cary	D	20	12	32	Sept. 5		....
Private.....	John Godfrey	K	15	16	31	May 20		1
First Lieut...	C. H. McIlvaine	B	17	14	31	May 20		....
Sergt. Major..	W. H. Travis	N.C.S	18	13	31	July 4	C. M. C.	....
Private.....	Edw. Walker	K	11	19	30	Aug. 26		1
Sergeant.....	C. H. Stuber (Col. B.)	N.C.S	13	17	30	Aug. 26		2
Private.....	J. H. Smith	D	15	15	30	May 20		2
Sergeant.....	C. W. Barnum (Hos. S.)	N.C.S	16	14	30	Aug. 27	C. M. C.	....
Private.....	E. A. Heritage	F	17	13	30	May 20		1
Private.....	E. E. Winchler	F	17	13	30	May 20		1
Corporal.....	F. G. F. Barlow	F	18	12	30	Aug. 27	C. M. C.	1
Private.....	C. M. Johnson	K	18	12	30	May 20		....
Corporal.....	W. R. Collins	G	19	11	30	May 20		2
Private.....	D. E. Nicholson	K	21	9	30	May 20		3
Private.....	F. Basch	I	13	16	29	June 16		1
Corporal.....	W. S. Burdett	G	14	15	29	May 20		1
Private.....	W. M. Burke	G	14	15	29	Aug. 26		...
Private.....	G. M. Wilson	K	14	15	29	May 20		....
Captain.....	J. M. Rankin	A	15	14	29	May 20		10
Sergeant.....	H. C. Lyon	A	15	14	29	Aug. 26		2
Private.....	R. H. Gibbons	K	15	14	29	May 20		....
Corporal.....	L. W. O'Connor	D	16	13	29	Oct. 28		1
Major.....	J. G. Eddy	Field	17	12	29	May 20		10
Sergeant.....	J. P. Carey	D	17	12	29	May 20		1
Sergeant.....	A. F. Engelhardt	F	18	11	29	May 20		....
Private.....	G. W. Woodward	E	10	18	28	May 20		....
Corporal.....	I. J. Ellmers	G	12	16	28	May 20		....
Private.....	M. J. Walsh	F	12	16	28	May 20		....
Private.....	C. Gilson	D	13	15	28	May 20		1
Private.....	W. F. Rover	K	13	15	28	Aug. 26		1
Corporal.....	W. J. Pell, Jr.	G	14	14	28	May 20		....
Private.....	John Surhoff	D	14	14	28	Oct. 28		....
Private.....	J. R. Mundy	F	14	14	28	May 20		1
Private.....	N. Hart	G	14	14	28	May 20		....
Private.....	T. H. Birdsall	K	14	14	28	May 20		....
Captain.....	G. C. Jeffery (Asst. S.)	Staff.	15	13	28	Aug. 26		1
Private.....	T. F. Burns	A	16	12	28	May 20		....
Private.....	J. W. Boerckel	E	16	12	28	May 20		....
Private.....	H. E. Smith	K	16	12	28	May 20		....
Private.....	J. G. Huston	K	17	11	28	May 20		....
Q. M. Sergt...	F. M. Baker	I	18	10	28	May 20		....
Corporal.....	S. J. Edine	G	18	10	28	May 20		....
Private.....	W. H. Martin	G	18	10	28	May 20		....
Private.....	Thos. Prendergast	G	18	10	28	Aug. 26		....
First Sergt....	G. E. Libby	G	19	9	28	May 20		2
Private.....	W. L. Cole	F	19	9	28	Aug. 26		3
Private.....	L. Kappas	K	12	15	27	May 20		....
Sergeant.....	Jos. Hart	K	13	14	27	May 20		....
First Lieut...	H. H. Quick	E	14	13	27	May 20		2
Private.....	C. E. Fisher	F	14	13	27	May 20		1
Sergeant.....	H. D. Van Zandt	F	15	12	27	May 20		5
Lieut. Col....	F. S. Benson	F	16	11	27	May 20		2
Sergeant.....	C. E. Wilkinson	F	16	11	27	Aug. 26		1

FORTY-SEVENTH REGIMENT — *(Concluded).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	E. Chickley	I	16	11	27	Aug. 26		
Private	Jas. Decker, Jr	K	17	10	27	May 20		
Private	Thos. Graham	K	17	10	27	July 4	C. M. C.	
Captain	F. J. Le Count, Jr.	K	18	9	27	May 20		9
Private	G. W. Wilds	A	18	9	27	May 20		1
Q. M. Sergt.	J. H. Saill	G	19	8	27	Aug. 26		
Sergeant	J. R. Anderson	A	10	16	26	May 20		1
Private	U. S. G. Bishop	D	11	15	26	Nov. 8	C. M. C.	
Private	W. T. Townsend	E	11	15	26	May 20		1
Private	C. W. Forrest	F	11	15	26	Aug. 26		
Private	A. W. Winchler	F	11	15	26	May 20		7
Private	W. L. Coultas	K	11	15	26	July 4	C. M. C.	1
Second Lieut.	E. F. Chustoffel	F	12	14	26	Sept. 5		1
Private	John Fletcher	I	12	14	26	May 20		
Private	J. H. Martin	I	13	13	26	May 20		
First Lieut.	W. H. Hubbell, (Adjt.)	Staff.	14	12	26	May 20		1
Private	J. Shaulip	K	14	12	26	May 20		
Private	J. H. Delmhorst	A	15	11	26	May 20		
Private	A. McMullin	B	15	11	26	Aug. 26		1
Private	H. H. Keoner	I	15	11	26	May 20		
Private	R. M. Stokes	F	16	10	26	Aug. 26		
Private	J. W. Fallon	I	16	10	26	Oct. 28		
Private	T. H. Hudson	K	16	10	26	May 20		
Q. M. Sergt.	C. H. Ridgway	K	17	9	26	May 20		8
Corporal	L. S. Ballou	I	17	9	26	May 20		1
Private	W. F. Barnes	A	17	9	26	May 20		
Private	I. Sweeney	D	17	9	26	Oct. 28		
Private	C. C. Myer	I	17	9	26	May 20		
Private	Wm. Wardell	F	19	7	26	May 20		
Private	C. G. Smith	G	19	7	26	May 20		
Private	B. F. Daly	A	9	16	25	May 20		
Sergeant	W. H. Geary	G	10	15	25	May 20		
Second Lieut.	E. E. Bishop	B	12	13	25	Oct. 28		
Sergeant	H. C. O. Schlegal	D	12	13	25	July 4	C. M. C.	1
Private	LeGrand Sturgis	F	12	13	25	May 20		2
Private	D. V. Smith	G	12	13	25	May 20		
Private	J. Rayer	D	14	11	25	Sept. 5		
Q. M. Sergt.	H. H. Hemmings	F	15	10	25	May 20		1
Corporal	N. Roscoe	G	15	10	25	Sept. 5		1
Private	J. H. Robbins	I	15	10	25	Oct. 28		
First Lieut.	A. V. Cobb	K	16	9	25	May 20		
Sergeant	J. D. Cook	D	16	9	25	Oct. 28		1
Private	W. J. Wilson	F	16	9	25	May 20		
Colonel	E. F. Gaylor	Field	17	8	25	Aug. 26		11
Sergeant	A. J. Yerks	K	17	8	25	May 20		
Captain	C. A. Denike	F	18	7	25	May 20		
Corporal	F. L. Firm	D	18	7	25	Oct. 28		1
Private	P. Wenwirth	F	19	6	25	May 20		

Total 131

SEVENTEENTH SEPARATE COMPANY.

(Figure of merit..... 80.79.)

RANK.	Name.	SCORES.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	John F. Klein*	23	25	48	May 28	C. M. C.	2
Private	J. D. Burtis*	24	23	47	Sept. 17	C. M. C.	1
Corporal	G. E. Gunyan*	20	22	42	July 16	C. M. C.	4
Sergeant	J. J. Simmons	20	20	40	Aug. 6	C. M. C.	10
Private	G. W. Halsey	18	20	38	June 18	C. M. C.	1
Corporal	H. H. Denton	19	18	37	May 20		4
Private	W. H. D. Nimmo, Jr	14	20	34	May 20		
Private	C. B. Jackson	19	15	34	May 20		1
Private	J. D. Hanlon	13	20	33	Aug. 26		
Private	J. C. Herrick	16	17	33	May 28	C. M. C.	1
Corporal	A. F. Shepard	18	15	33	June 11	C. M. C.	5
Private	H. H. Lawrence	17	15	32	Aug. 26		4
Private	T. L. Proctor	13	18	31	July 16	C. M. C.	
Private	J. E. A. Thompson	14	17	31	Nov. 8	C. M. C.	
Second Lieut.	Jos. Fitch	16	15	31	Aug. 26		5
Private	F. W. Lincoln	16	15	31	June 18	C. M. C.	4
Private	T. A. Lowden	17	14	31	Aug. 26		4
Private	J. A. Walker	12	17	29	Aug. 26		
Private	W. J. Lake	17	12	29	Aug. 26		3
Private	T. F. Moore	20	9	29	Aug. 26		
Private	J. A. Pratt	20	9	29	May 20		4
Private	A. E. Gosling	13	15	28	Aug. 26		
Private	T. B. Lowerre, Jr	13	15	28	Aug. 26	C. M. C.	
Sergeant	W. R. Prall	14	14	28	Aug. 26		6
Corporal	M. F. Covert	16	12	28	May 20		3
Private	Leon Doncourt	19	9	28	May 20		3
Private	E. F. Cheshire	11	16	27	June 11	C. M. C.	6
Private	T. J. Blain	13	14	27	Aug. 20		1
Q. M. Sergt.	G. W. Haviland, Jr	14	13	27	May 20		10
Corporal	R. J. Lowden	16	11	27	June 11	C. M. C.	5
Private	M. S. Wood	17	10	27	Aug. 20		2
Private	H. K. Bogart	18	9	27	Oct. 15	C. M. C.	
Private	J. L. Bogart	19	8	27	Oct. 15	C. M. C.	5
Sergeant	R. H. Baker	11	15	26	July 30	C. M. C.	9
Private	J. A. Lenahan	11	15	26	Nov. 8	C. M. C.	
Sergeant	W. F. Boardman	13	13	26	May 20		7
Corporal	E. H. Gates	13	13	26	May 20		4
Private	G. A. S. Weiners	15	11	26	May 20		1
Private	M. J. Hogan	16	10	26	May 20		
Private	William Schilling	17	9	26	May 20		2
Captain	Thomas Miller, Jr	18	8	26	Aug. 26		9
Private	D. H. Vandewater	18	8	26	May 20		7
Private	W. G. Burdett	7	18	25	May 28	C. M. C.	
Private	A. E. Howard	14	11	25	June 11	C. M. C.	
Private	W. P. Walsh	15	10	25	May 20		2
Private	James Finlayson	18	7	25	May 20		3
Private	George Walsh	18	7	25	Aug. 13	C. M. C.	
First Sergt.	F. N. Bell	19	6	25	May 20		7

Total..... 48.

THIRD BRIGADE.

(Figure of merit.....56.93.)

GENERAL AND STAFF.

(Figure of merit..... 8.33.)

ANK.	Name.	Company.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Major.....	Charles H. Gaus.....	I.R.P	24	24	48	Sept. 8	C. M. C.....	5

Total..... 1.

TENTH BATTALION.

(Figure of merit.....52.33.)

RANK.	Name.	Company.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private.....	S. Schreiber*.....	B	21	25	46	Oct. 7	C. M. C.	3
Lieut.-Col. ...	W. E. Fitch*.....	F	22	24	46	Nov. 3	C. M. C.	5
Ord. Sergeant	James J. Miles*.....	N.C.S	21	24	45	Oct. 7	C. M. C.	5
Captain.....	E. V. Denison*.....	D	20	24	44	Sept. 7	.....	9
Q. M. Sergt...	B. R. Spellman, Jr.*.....	N.C.S	20	24	44	Oct. 7	C. M. C.	9
Corporal.....	A. H. Rennie*.....	B	19	24	43	Sept. 8	C. M. C.	2
Sergeant.....	Chris. Gresham*.....	C	23	20	43	Aug. 29	.....	3
First Lieut ...	W. T. Miles*	F	19	23	42	Oct. 7	C. M. C.	5
Private	J. E. Smith*.....	A	19	23	42	Oct. 7	C. M. C.	2
Second Lieut.	A. W. La Rose*	D	20	22	42	Sept. 7	.....	4
Captain.....	H. P. Stacpole*	B	22	20	42	Oct. 13	C. M. C.	8
Second Lieut.	G. J. Green*.....	B	22	20	42	Oct. 13	C. M. C.	4
Sergeant	C. S. Winnie*.....	C	22	20	42	Aug. 29	.....	2
Private	W. E. De Barthe*.....	B	22	20	42	Sept. 5	.....	2
Sergeant.....	Jas. Roach*.....	C	23	19	42	Aug. 29	.....	2
Captain.....	J. L. Hyatt.....	C	20	21	41	Aug. 29	.....	3
First Sergt....	C. E. Stott.....	C	19	20	39	Aug. 29	.....	1
Corporal.....	Geo. Reed.....	C	20	19	39	Aug. 29	.....	2
First Lieut ...	S. D. Hyatt.....	C	21	18	39	Aug. 29	.....	1
Sergeant	T. J. Van Antwerp	A	18	19	37	Sept. 5	C. M. C.	3
Q. M. Sergt...	M. W. Stickney	B	20	17	37	Sept. 5	.....	5
Private	C. R. La Rose	B	20	17	37	Sept. 5	.....	....
Corporal.....	A. A. Allen	B	18	18	36	Sept. 5	.....	4
First Sergt ...	A. E. Batchelder.....	B	20	16	36	Sept. 5	.....	3
Private	F. J. Kennedy.....	B	21	15	36	Sept. 5	.....	1
Private	G. Lundborg.....	A	17	17	34	Oct. 28	.....	....
First Sergt...	C. P. Williams, Jr.....	A	20	14	34	Oct. 7	C. M. C.	1
Private	E. E. Larkin	A	16	17	33	Oct. 28	.....	....
Captain.....	A. J. Wing	A	18	15	33	Nov. 3	C. M. C.	2
Private	E. Morey	D	18	15	33	Sept. 7	.....	3
Sergeant	H. Simmons	B	19	14	33	Sept. 5	.....	3
Corporal.....	Chas. Massison.....	C	19	14	33	Aug. 29	.....	3
Sergeant	H. C. Staats	B	20	13	33	Sept. 5	.....	2
Q. M. Sergt...	J. Haswell.....	A	17	15	32	Sept. 9	.....	2
Private	H. Cook	B	20	12	32	Sept. 5	.....	1
Second Lieut.	A. L. Judson.....	A	17	14	31	Oct. 24	.....	4
Sergeant	C. S. Byington	A	17	14	31	Sept. 9	.....	1
Private	J. K. Dunscomb	A	17	14	31	Sept. 9	.....	....
Private	S. Y. Southard.....	A	19	12	31	Oct. 21	C. M. C.	1
Private	E. A. Blessing	B	15	15	30	Sept. 5	.....	....
Private	E. C. Leonard.....	A	16	14	30	Sept. 9	.....	....
Sergeant	J. J. Mahon	C	17	13	30	Oct. 28	.....	....
Corporal.....	H. W. Robbins.....	B	17	13	30	Sept. 5	.....	2
Private	G. P. Bingham.....	B	17	13	30	Sept. 5	.....	1
Private	R. F. Van Heusen	A	18	12	30	Sept. 9	.....	....

TENTH BATTALION — *(Concluded).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Private	H. G. Stevens	B	19	11	30	Sept. 5		7
Corporal	Geo. Arris	C	20	10	30	Aug. 29		1
Private	G. L. Flanders	B	15	14	29	Oct. 28		2
Private	G. B. Craven	B	16	13	29	Sept. 5		8
Major	N. Chase	Field	17	12	29	Sept. 9		1
Corporal	C. B. Staats	B	17	12	29	Sept. 5		2
Private	M. L. Earing	B	17	12	29	Sept. 5		
Private	H. Hogle	B	17	12	29	Sept. 5		2
Private	C. H. Heck	B	18	11	29	Oct. 28		
Private	C. B. Angle	A	12	16	28	Sept. 9		
First Lieut	A. J. Kiernan	D	16	12	28	Sept. 7		1
Sergeant	L. M. Crandell (Col. B.)	N.C.S	16	12	28	Sept. 9		
Private	R. T. Webster	A	16	12	28	Sept. 9		
Private	J. C. McClelland	B	16	12	28	Sept. 5		
Private	J. G. Burch, Jr	B	18	10	28	Sept. 5		1
Private	E. McN. Mann	B	18	10	28	Sept. 5		2
Private	J. M. Holler	B	19	9	28	Sept. 5		
Private	Wm. Coogan	C	20	8	28	Aug. 29		
Private	J. Long	B	21	7	28	Sept. 5		1
Private	M. C. Lentz	D	11	16	27	Oct. 28		
Private	W. C. Rose	A	14	13	27	Sept. 9		1
Private	J. B. Hendrick	A	15	12	27	Sept. 9		
Private	F. C. Herrick	A	16	11	27	Sept. 9		
Private	M. R. Searing	B	16	11	27	Sept. 5		
Private	T. A. Ryan	D	16	11	27	Sept. 7		
Private	J. B. Wood	D	16	11	27	Oct. 28		
Corporal	B. C. Tinney	C	17	10	27	Oct. 28		1
Private	C. M. Van Heuson	A	17	10	27	Sept. 9		
Private	W. M. Crehan	B	18	9	27	Oct. 28		
Private	F. W. Van Slyck	B	18	9	27	Sept. 5		
Q. M. Sergt	D. McManamey	D	19	8	27	Oct. 28		2
Private	R. A. Hamilton	A	13	13	26	Sept. 9		1
Private	H. S. Apple	D	13	13	26	Sept. 7		1
Sergeant	Jas. Morrow (L. G. G.)	N.C.S	14	12	26	Sept. 9		2
Private	F. Ehrmann	A	14	12	26	Oct. 28		
Private	W. W. Hoit	A	14	12	26	Sept. 9		
Private	U. S. G. Horner	A	15	11	26	Sept. 9		
Private	W. H. Butler	D	16	10	26	Oct. 28		
First Lieut	A. W. Pray	A	17	9	26	Sept. 9		2
Private	G. C. Luby	C	17	9	26	Aug. 29		
Private	F. H. Gates	D	17	9	26	Oct. 28		
Sergeant	J. A. Wolff	D	18	8	26	Oct. 28		
Private	C. J. Phisterer	B	18	8	26	Sept. 5		2
Private	William Baker	D	18	8	26	Oct. 28		1
Private	A. Fisher	B	12	13	25	Sept. 5		
Private	J. G. Lather	D	12	13	25	Sept. 7		
Sergeant	F. Easton	A	13	12	25	Oct. 28		
Private	F. Luby	C	13	12	25	Aug. 29		
Private	H. A. Vanderpoel	A	14	11	25	Sept. 9		
Private	A. Merchant	C	14	11	25	Oct. 28		
Corporal	R. J. Warnds	B	15	10	25	Oct. 28		
Private	F. B. Holridge	A	15	10	25	Sept. 9		1
Private	W. Kundall	C	15	10	25	Oct. 28		
Private	J. G. Apple	D	15	10	25	Sept. 7		2
Corporal	T. S. Craig	A	16	9	25	Sept. 9		
Private	C. Swartz	C	16	9	25	Oct. 28		
Private	E. W. Vine	A	17	8	25	Sept. 9		
Private	W. S. Corliss	B	17	8	25	Sept. 5		2
Private	J. C. Welch	B	17	8	25	Sept. 5		
Private	John Grube	C	18	7	25	Aug. 29		
Private	H. Roth	C	19	6	25	Aug. 29		

Total 106

THIRD SEPARATE COMPANY.

(Figure of merit..... 65.51.)

RANK.	Name.	SCORES.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Corporal	A. L. Kellogg	20	20	40	Oct. 18		6
Private	O. Epes	21	19	40	Oct. 18		1
First Sergt.	B. Mattin	17	22	39	June 27		7
Captain	Walter Scott	20	19	39	June 27		6
Corporal	C. D. Brownell	17	20	37	Oct. 18		5
Private	W. A. Dearstyne	15	19	34	Oct. 18		4
Private	R. G. Spencer	15	19	34	June 27		1
Private	J. S. Corse	17	17	34	June 27		
Private	G. W. Hodge	18	15	33	June 27		1
Private	G. H. Richardson	20	13	33	Oct. 18		2
Private	H. Hoag	21	12	33	Oct. 18		1
Sergeant	J. McMurtrie	16	16	32	Oct. 18		4
Private	H. C. Morrill	18	14	32	June 27		
Sergeant	W. J. Strait	20	12	32	June 27		5
Private	S. Ferris	13	18	31	June 27		
Private	H. Moak	16	15	31	Oct. 18		
Corporal	J. M. Roney	15	15	30	June 27		4
Private	W. E. Fairchild	16	14	30	June 27		1
Private	B. W. Hoye	16	14	30	June 27		2
Private	H. Lothrop	20	10	30	Oct. 18		
Private	H. Patton	13	16	29	Oct. 18		
Private	J. D. Wilson	13	16	29	Oct. 18		
Private	B. L. Beach	16	13	29	June 27		1
Corporal	W. C. Gurney	11	17	28	June 27		5
Private	A. J. Platt	13	15	28	June 27		
Private	A. L. Spencer	13	15	28	Oct. 18		4
Private	I. D. Bullock	15	13	28	June 27		1
Private	J. Goodrich	16	12	28	Oct. 18		
Private	E. E. Hill	16	12	28	Oct. 18		
Private	E. D. Hitt	17	11	28	June 27		
Private	J. L. Davenport	14	13	27	June 27		
Private	Jas. Gambell	15	12	27	June 27		
Private	E. Merritt	15	12	27	June 27		2
Sergeant	H. E. Spencer	16	11	27	June 27		4
Private	M. E. Roarick	19	8	27	June 27		6
Private	T. H. Haggerty	11	15	26	Oct. 18		
Private	Wm. Scott	11	15	26	June 27		
Private	E. A. Hayward	13	13	26	June 27		
Corporal	J. D. Roarick	13	13	26	Oct. 18		4
Private	F. Maring	14	12	26	Oct. 18		
Private	S. H. Lane	15	11	26	June 27		
Private	G. E. Bouck	16	10	26	June 27		
Private	H. M. Patton	17	9	26	Oct. 18		
Private	W. P. Suits	17	9	26	Oct. 18		
Private	H. G. Kinney	19	7	26	Oct. 18		2
Private	S. A. Disbrow	9	16	25	Oct. 18		
Private	G. H. Turk	9	16	25	June 27		
Corporal	E. Price	13	12	25	June 27		5

Total..... 48

FOURTH SEPARATE COMPANY.

(Figure of merit..... 63.73.)

RANK.	Name.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	Wm. Thompson	21	20	41	Oct. 28		1
Private	J. Pagan, Jr.	19	18	37	Aug. 5		1
First Lieut.	*John I. Pruyn*	19	17	36	Oct. 28		12
Private	George White	18	14	32	Aug. 5		1
First Lieut.	G. F. Whitney (Asst. Surg.)	12	19	31	Aug. 5		....
Captain	*R. Cobb*	20	11	31	Aug. 5		12
Private	O. Olsen	16	14	30	Aug. 5		....
Private	E. Wood	17	13	30	Aug. 5		....
Private	G. B. Warren	15	14	29	Aug. 5		....
Sergeant	Thos. Oliver	18	11	29	Oct. 28		7
Private	G. R. Stephens	18	11	29	Oct. 28		....
Private	J. J. Dykes	12	16	28	Oct. 28		....
Private	H. B. Palmer	19	9	28	Aug. 5		....
Private	H. Steadman	13	14	27	Oct. 28		....
Private	G. J. Frazier	15	12	27	Oct. 28		3
Private	James Frazier	15	12	27	Aug. 5		....
Private	A. K. Shipman	16	11	27	Aug. 5		....
Private	A. Suydam	17	10	27	Aug. 5		....
Private	Wm. Chapman	18	9	27	Oct. 28		....
Private	J. C. Pulsifer	12	14	26	Oct. 28		....
Private	Geo. Conklyn	14	12	26	Aug. 5		3
Private	W. McPherson	14	12	26	Aug. 5		....
Private	A. W. Nugent	14	12	26	Oct. 28		1
Corporal	J. F. Christie	16	10	26	Aug. 5		2
Private	B. G. Berrian	16	10	26	Oct. 28		1
Second Lieut.	W. H. McVicar	18	8	26	Aug. 5		5
Private	T. A. Robinson	13	12	25	Aug. 5		1
Private	F. Chadrayne	15	10	25	Aug. 5		2
Private	F. Narr	15	10	25	Oct. 28		1
Private	G. S. Seaman	15	10	25	Aug. 5		....
Private	F. S. Brown	16	9	25	Aug. 5		....

Total..... 31

FIFTH SEPARATE COMPANY.

(Figure of merit..... 45.67.)

RANK.	Name.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	Geo. Carter	21	18	39	Sept. 26		....
First Sergt.	H. Fairchild	18	20	38	Aug. 15		8
Private	M. B. Tillstson	12	24	36	Sept. 26		....
Corporal	F. K. Hulslander	21	15	36	Sept. 26		1
Captain	Jas. T. Chase	16	19	35	Aug. 15		6
Private	G. N. Chase	12	22	34	Oct. 12		....
Private	W. W. Grogan	15	19	34	Sept. 26		....
Private	A. Smith	15	19	34	Aug. 15		2
Private	J. Gallager	16	18	34	Sept. 26		....
Corporal	G. V. Halfner	20	14	34	Sept. 26		....
Sergeant	T. J. Mocler	15	18	33	Aug. 15		1
First Lieut.	J. H. Wells	20	13	33	Aug. 15		1
Corporal	D. J. McKay	17	15	32	Sept. 26		....
Private	C. B. Hunt	19	13	32	Sept. 26		....
Q. M. Sergt.	P. O'Brien	21	10	31	Sept. 26		1
Private	C. S. Wood	12	18	30	Oct. 10		....
Private	G. W. Walker	15	14	29	Sept. 26		....

FIFTH SEPARATE COMPANY — *(Concluded).*

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	M. Ryan	18	11	29	Sept. 26		
Private	F. H. Wood	12	16	28	Oct. 10		
Private	M. J. Kennedy	16	12	28	Oct. 10		
Corporal	Jos. A. Devine	14	13	27	Oct. 10		1
Sergeant	M. J. Kinney	15	12	27	Aug. 15		2
Private	C. B. Cooper	18	8	27	Aug. 15		
Private	R. Hanna	19	8	27	Sept. 26		
Private	F. A. Booth	21	6	27	Aug. 15		
Private	G. N. Hulslander	21	6	27	Oct. 10		
Private	J. F. Flanigan	12	14	26	Aug. 15		
Private	H. E. Dunn	16	10	26	Aug. 15		
Private	John Robinson	16	10	26	Sept. 26		
Private	Jos. Kadrisky	18	8	26	Oct. 10		
Private	L. A. Hunt	19	7	26	Oct. 10		
Private	F. Berry	20	6	26	Aug. 15		
Private	F. A. Hoyt	22	4	26	Aug. 15		
Corporal	H. Fischer	12	13	25	Aug. 15		
Private	J. B. McCarrie	14	11	25	Aug. 5		
Private	T. F. Ryan	16	9	25	Aug. 15		
Private	H. G. Scott	17	8	25	Sept. 26		
Private	B. O'Ward	17	8	25	Sept. 26		
Private	F. W. Clark	18	7	25	Sept. 26		

Total 39

SIXTH SEPARATE COMPANY.

(Figure of merit ..... 72.69.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	T. W. Hislop*	21	23	44	Sept. 22	C. M. C.	4
Private	J. G. Zimmermann*	22	22	44	Sept. 2		10
Corporal	C. E. Knickerbocker*	20	22	42	Sept. 6		4
Sergeant	E. L. Everett*	21	21	42	Oct. 28		6
Private	R. M. Townsend, Jr.*	21	21	42	Sept. 16		6
Private	E. A. King	17	21	38	Oct. 21	C. M. C.	8
First Sergt	W. H. Stillman	18	20	38	Sept. 2		10
Private	J. C. Fursman	18	19	37	Sept. 6		
Private	J. M. Sherrerd	20	17	37	Sept. 6		3
Private	J. C. Chapin	16	20	36	Oct. 27	C. M. C.	3
Private	J. H. Lloyd	18	18	36	Sept. 6		4
Private	F. C. Brewster	18	17	35	Sept. 6		3
Private	W. T. Williamson	13	21	34	Sept. 2		
Private	F. C. Comstock	15	19	34	Oct. 21	C. M. C.	4
Private	J. H. Tupper	12	21	33	Sept. 2		3
Corporal	W. B. Madden	15	18	33	Sept. 2		10
Private	A. M. Ide	15	18	33	Sept. 2		1
Private	A. S. Johnston	16	17	33	Sept. 6		
Private	Jos. A. Wells	16	17	33	Oct. 21	C. M. C.	3
Sergeant	H. M. Caswell	17	16	33	Oct. 21	C. M. C.	7
Private	J. H. Harrington	17	16	33	Oct. 28		4
Private	T. S. Hoyt	18	15	33	Oct. 21	C. M. C.	9
Private	Thos. Vail	18	15	33	Sept. 6		4
Second Lieut.	G. D. Smith	20	13	33	Sept. 2		8
Private	S. P. McClellan	16	16	32	Sept. 2		3
Private	J. F. Norton	16	16	32	Sept. 6		
Private	M. D. W. Burdick	19	13	32	Sept. 6		1

SIXTH SEPARATE COMPANY — *(Concluded).*

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	G. T. Bestle	14	17	31	Sept. 2		....
Q. M. Sergt	E. P. Mann	16	15	31	Sept. 6		9
Corporal	C. J. Tappen	17	14	31	Sept. 2		5
Private	M. D. Russell	17	14	31	Sept. 6		3
Private	H. D. Schoonmaker	18	13	31	Sept. 6		1
Private	Chas. Farnham	13	17	30	Oct. 27	C. M. C.	2
Private	H. T. Whited	14	16	30	Sept. 6		....
Private	G. L. French	15	15	30	Sept. 2		5
Corporal	W. R. Bridges	17	13	30	Oct. 27	C. M. C.	4
Corporal	F. E. Norton	18	12	30	Oct. 21	C. M. C.	6
Private	C. S. Bruntnall	19	11	30	Sept. 2		9
Private	J. R. Lyon	19	11	30	Sept. 6		1
Private	D. H. Dyer	15	14	29	Sept. 6		2
Sergeant	H. H. Shields	16	13	29	Sept. 2		9
Private	C. E. Thompson	16	13	29	Oct. 27	C. M. C.	4
Private	P. A. Morse	18	11	29	Oct. 27	C. M. C.	4
Private	W. H. Barnes	19	10	29	Sept. 6		9
Sergeant	W. C. Buell	13	15	28	Sept. 6		7
Private	J. C. Kyd	15	13	28	Sept. 6		2
Private	H. F. Andrews	16	12	28	Oct. 27	C. M. C.	1
Private	H. W. Frame	16	12	28	Sept. 2		1
Private	E. Bussey, Jr.	17	11	28	Oct. 27	C. M. C.	1
Private	S. P. Hunt	17	11	28	Sept. 6		2
Private	M. R. Mosher	17	11	28	Oct. 27	C. M. C.	4
Private	J. B. Wilkinson	18	10	28	Oct. 27	C. M. C.	5
Private	H. P. Sherman	13	14	27	Nov. 3	C. M. C.	....
Private	J. J. Magill	14	13	27	Sept. 6		....
Corporal	P. B. McCoy	16	11	27	Oct. 28		8
Private	J. G. Manning	17	10	27	Sept. 2		4
Private	J. D. Colby	18	9	27	Sept. 22	C. M. C.	....
Private	G. H. Lee	18	9	27	Sept. 6		4
Captain	J. W. Cusack	19	8	27	Sept. 6		1
Private	O. T. Warren	12	14	26	Sept. 22	C. M. C.	1
Private	S. G. Curtis	13	13	26	Sept. 6		3
Private	W. H. Kincaid, Jr.	13	13	26	Sept. 6		....
Private	R. Bestle	14	12	26	Oct. 27	C. M. C.	....
Private	A. W. Harrington, Jr.	15	11	26	Sept. 6		5
Private	S. D. Smith	15	11	26	Sept. 6		3
Private	H. B. Ward	15	11	26	Sept. 6		....
Private	F. W. Thomas	16	10	26	Sept. 22	C. M. C.	1
First Lieut	J. L. Thompson	17	9	26	Oct. 27	C. M. C.	2
Private	F. O. Stiles, Jr.	17	9	26	Sept. 6		....
Private	W. J. Wyley	13	12	18	Sept. 6		2
Private	C. N. Church	14	11	25	Oct. 28		4
Private	Hugh Galbraith	14	11	25	Sept. 6		1
Private	J. A. Ide	14	11	25	Sept. 6		1
Private	E. S. Strait	14	11	25	Oct. 27	C. M. C.	3
Private	G. W. Starkweather	14	11	25	Sept. 6		2
Private	B. J. Tolhurst	14	11	25	Sept. 6		....
Private	G. A. Darby	15	10	25	Sept. 6		1
First Lieut	C. C. Schuyler (Asst. Surg.)	18	7	25	Sept. 6		3
Private	I. F. Cragin	18	7	25	Oct. 27	C. M. C.	4
Private	F. H. Richards	18	7	25	Sept. 6		....

Total 80

SEVENTH SEPARATE COMPANY.

(Figure of merit..... 76.71.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Corporal.....	E. E. Van Hansen*.....	23	21	44	Aug. 16	.....	2
Private	H. Hammond*.....	19	24	43	Aug. 19	.....	2
Second Lieut.	I. J. McNeil*.....	22	21	43	Aug. 16	.....	5
Sergeant	F. G. White*.....	23	20	43	Sept. 20	.....	1
Private	Jas. Henry*.....	20	22	42	Sept. 20	.....	....
First Lieut ...	T. C. Collin*.....	21	21	42	Sept. 20	.....	4
Private	L. Bondrias, Jr*.....	21	21	42	Sept. 20	.....	1
Private	G. B. Griffin.....	21	19	40	Sept. 20	.....	1
Private	I. E. McShane.....	19	18	37	Aug. 16	.....	1
Private	R. B. Baker.....	21	16	37	Sept. 20	.....	....
Private	J. H. Howarth.....	17	19	30	Sept. 20	.....	1
First Lieut ...	J. H. Mitchell.....	19	17	36	Aug. 16	.....	....
Captain.....	P. G. Tymerson.....	20	16	36	Aug. 16	.....	4
Private	F. W. Collins.....	20	16	36	Aug. 16	.....	1
Corporal.....	J. H. Brierly.....	18	17	35	Aug. 16	.....	3
Private	Thomas Nelligan.....	18	17	35	Sept. 20	.....	....
Sergeant.....	Chris. Bindewald, Jr.....	16	18	34	Aug. 16	.....	3
Corporal.....	W. F. Stone.....	21	13	34	Aug. 16	.....	2
Private	J. McGaffin.....	16	17	33	Aug. 16	.....	....
Private	Q. S. McNeil.....	18	15	33	Aug. 16	.....	1
Private	W. Snell.....	18	15	33	Aug. 16	.....	1
Private	L. J. Jeannim.....	19	14	33	Sept. 20	.....	1
Private	G. W. Peck.....	19	14	33	Aug. 16	.....	1
Private	Geo. McLean.....	21	12	33	Sept. 20	.....	....
First Sergt ...	G. D. Jackson.....	17	15	32	Aug. 16	.....	1
Private	E. Allen.....	17	15	32	Aug. 16	.....	1
Q. M. Sergt...	W. H. Henry.....	18	14	32	Aug. 16	.....	3
Private	William Toomey.....	19	12	31	Sept. 20	.....	....
Corporal.....	W. D. Boswell.....	13	17	30	Aug. 16	.....	1
Private	H. Kimball.....	13	17	30	Aug. 16	.....	....
Private	George Jewett.....	20	10	30	Sept. 20	.....	1
Private	Wm. Scott.....	21	9	30	Sept. 20	.....	....
Private	F. F. McDermott.....	14	15	29	Aug. 16	.....	....
Private	J. J. Seckner.....	14	15	29	Aug. 16	.....	1
Private	J. E. Daley.....	15	14	29	Aug. 16	.....	1
Private	Jos. Kinton.....	17	12	29	Aug. 16	.....	....
Private	W. H. Higgins.....	17	11	28	Aug. 16	.....	1
Sergeant	A. D. Jones.....	19	9	28	Aug. 16	.....	4
Private	H. Armstrong.....	16	11	27	Aug. 16	.....	....
Private	E. G. Felix.....	17	10	27	Aug. 16	.....	....
Corporal.....	P. H. Spillman.....	18	9	27	Aug. 16	.....	1
Private	P. F. Joyce.....	18	9	27	Aug. 16	.....	1
Sergeant	J. H. Ballard.....	11	15	26	Aug. 16	.....	1
Private	T. L. Hillabrant.....	12	14	26	Aug. 16	.....	....
Corporal.....	William Fairchilds.....	13	13	26	Aug. 16	.....	....
Private	H. S. Kavanagh.....	13	13	26	Aug. 16	.....	....
Private	Charles Nuttall.....	13	13	26	Aug. 16	.....	....
Private	W. A. Ross.....	13	13	26	Aug. 16	.....	1
Private	J. H. Bennahan.....	14	12	26	Sept. 20	.....	....
Private	F. W. Steinmacher.....	14	12	26	Aug. 16	.....	....
Private	D. B. Mott.....	15	11	26	Aug. 16	.....	....
Private	C. A. Conlin.....	16	10	26	Sept. 20	.....	1
Private.....	C. F. Jones.....	18	8	26	Aug. 16	.....	1
Private.....	C. Sibbalt.....	11	14	25	Aug. 16	.....	....
Private.....	J. C. Laing.....	12	13	25	Aug. 16	.....	1
Private.....	G. W. Dean.....	13	12	25	Aug. 16	.....	1
Private.....	J. D. Lighthall.....	14	11	25	Aug. 16	.....	....
Private.....	E. Penders.....	15	10	25	Aug. 16	.....	....

Total..... 58

NINTH SEPARATE COMPANY.

(Figure of merit.....71.19.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
First Sergt...	T. A. Patterson*.....	22	21	43	Sept. 29	.....	9
Q. M. Sergt...	L. W. Finch*.....	22	21	43	Sept. 29	.....	8
Sergeant	J. C. Hopson*.....	22	21	43	Sept. 29	.....	4
Private.....	C. T. Beardman*.....	22	21	43	Sept. 29	.....	2
Corporal.....	A. Dorval.....	19	20	39	Sept. 29	.....	9
Private	A. D. Bartholomew	19	20	39	July 15	.....	1
Private	W. T. Allen	17	21	38	Sept. 29	.....	3
Sergeant	O. A. Dennis.....	20	18	38	Sept. 29	.....	5
Private	F. M. Greenough.....	18	15	33	July 15	.....	4
Private	H. H. Farrell.....	19	14	33	Sept. 29	.....	....
Sergeant	C. A. Jilson	16	16	32	Sept. 29	.....	6
Private	W. H. Pardo	16	16	32	Sept. 29	.....	....
Corporal.....	C. M. Hotchkiss	17	15	32	Sept. 29	.....	4
Private	F. C. Cooke	17	14	31	July 15	.....	3
Private	E. W. Chase.....	15	15	30	Sept. 29	.....	4
Private	J. J. Greenough.....	14	15	29	Sept. 29	.....	3
Private	A. McNeeley.....	13	15	28	Sept. 29	.....	1
First Lieut ...	B. C. Senton	17	11	28	July 15	.....	3
Private	E.C. Latham.....	13	14	27	Sept. 29	.....	....
Private	J. H. Waters.....	16	11	27	July 15	.....	1
Second Lieut.	R. A. Hall.....	18	9	27	July 15	.....	6
Private	W. J. Edwards.....	7	19	26	Sept. 29	.....	1
Private	Edw. Geffo.....	13	13	26	July 15	.....	1
Private	L. J. Belgarde..... ...	17	8	25	July 15	.....	2

Total 24

TENTH SEPARATE COMPANY.

(Figure of merit..... 53.22.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
First Sergt....	H. Bond.....	20	19	39	Oct. 12	.....	9
Q. M. Sergt ...	D. W. Jagger.....	18	20	38	Oct. 12	.....	2
Private	J. J. Harison.....	19	17	36	Oct. 12	.....	4
Captain	W. H. Smith	16	18	34	Aug. 26	.....	9
Private	A. L. Dunphy.....	19	15	34	Aug. 16	.....	1
Private	C. B. Shaw, Jr	13	19	32	Aug. 16	.....	2
Corporal.....	J. S. Taylor.....	16	16	32	Aug. 16	.....	4
Corporal.....	L. Landphier	13	18	31	Oct. 12	.....	....
Corporal.....	T. T. Haviland	20	11	31	Aug. 16	.....	3
Corporal.....	L. W. Y. McCroskey.....	13	17	30	Aug. 16	.....	5
First Lieut ...	W. J. Whited	14	16	30	Aug. 16	.....	1
Private	J. C. Hyndman	14	16	30	Oct. 12	.....	....
Private	Jac. Herman	10	19	29	Oct. 12	.....	....
Private	J. A. Rush	15	14	29	Oct. 12	.....	....
Private	W. H. Hyndman.....	16	13	29	Aug. 16	.....	1
Private	W. A. Kydd	16	12	28	Aug. 16	.....	3
Private	G. F. Thompson	18	9	27	Oct. 12	.....	....
Private	D. H. Bower	16	10	26	Oct. 12	.....	....
Private	C. H. Buchanan	16	10	26	Aug. 16	.....	2
Private	W. N. Beggs	18	8	26	Oct. 12	.....	....

Total 20

ELEVENTH SEPARATE COMPANY.

(Figure of merit..... 47.08.)

RANK.	Name.	SCORES.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	G. W. Coling	15	14	29	Aug. 5		
Private	S. J. Stillwell	17	12	29	Aug. 5		
Private	William Crowenberg	13	15	28	Aug. 5		1
Private	A. H. Huppelsburg	15	13	28	Aug. 5		1
Private	O. Gunther	16	12	28	Aug. 5		
Private	R. W. Redmond	17	10	27	Aug. 5		1
Private	A. St. J. Sheppard	18	9	27	Aug. 5		1
Private	S. D. Hunt	16	10	26	Aug. 5		
Private	J. A. Horton	16	10	26	Aug. 5		
Private	James Barker	17	9	26	Aug. 5		
Private	W. A. Wright	12	13	25	Aug. 5		
Private	G. Van Pelt	14	11	25	Aug. 5		2
Second Lieut.	Joseph E. Taverner	15	10	25	Aug. 5		4

Total..... 13.

TWELFTH SEPARATE COMPANY.

(Figure of merit..... 33.75.)

RANK.	Name.	SCORES.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
First Sergt	W. F. Martin	16	17	33	Aug. 2		1
Private	Charles Grenon	15	14	29	Aug. 2		1
Private	J. B. Ryan	20	9	29	Aug. 2		
Private	E. Reynolds	16	12	28	Aug. 2		
Private	John Jones	17	11	28	Aug. 2		2
Private	G. Chippendale, Jr.	14	13	27	Aug. 2		1
Private	F. B. Tibbits	14	13	27	Aug. 2		
Private	George McKinney	12	14	26	Aug. 2		
Private	W. A. Van Decar	12	14	26	Aug. 2		
Private	M. D. Mahoney	13	13	26	Aug. 2		1
Private	G. R. Roden	15	11	26	Aug. 2		
Private	E. L. Bramen	16	10	26	Aug. 2		
Private	C. S. B. Northrup	17	9	26	Aug. 2		
Private	James McCallen	12	13	25	Aug. 2		1

Total..... 14.

THIRTEENTH SEPARATE COMPANY.

(No practice.)

FOURTEENTH SEPARATE COMPANY.

(Figure of merit..... 63.63.)

RANK.	Name.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Second Lieut.	J. E. Van Ettan*	19	24	43	Sept. 14	.....	3
Private	J. G. Mafera	18	19	37	Sept. 14	.....	3
Sergeant	C. H. Van Gaasbeck	17	19	36	Oct. 12	.....	2
Captain.....	B. J. Hornbeck	19	17	36	Aug. 19	.....	5
Private	L. E. Van Ettan	14	21	35	Sept. 14	.....	1
Private	J. Deyo	19	16	35	Oct. 12	.....	1
Private	E. G. Comstock	17	17	34	Sept. 14	.....	....
Private	C. L. Drautz	18	15	34	Oct. 12	.....	1
Private	W. Van Buren	13	19	32	Oct. 12	.....	2
Private	J. H. Burhans	14	17	31	Aug. 19	.....	....
First Sergt ...	E. M. Townsend	18	13	31	Sept. 14	.....	1
Private	G. P. Taylor	20	11	31	Sept. 14	.....	1
Private	Fred. Quant	15	15	30	Sept. 14	.....	2
First Lieut ...	C. W. Cuspell (Asst. Surg.)	16	13	29	Aug. 19	.....	3
Private.....	A. W. Cooper	12	16	28	Sept. 14	.....	1
Private.....	John Turck	13	15	28	Aug. 19	.....	2
Corporal.....	A. E. Leete	14	14	28	Oct. 12	.....	2
Private	R. Dane	16	12	28	Aug. 19	.....	....
Private	W. F. O'Brien	13	14	27	Oct. 12	.....	1
Private	M. Eckert	15	12	27	Aug. 19	.....	....
Private	J. P. Erdman	12	14	26	Aug. 19	.....	....
Private	R. F. Tompkin	12	14	26	Sept. 14	.....	3
Private	E. J. Adrance	13	13	26	Aug. 19	.....	....
Private	C. W. Prull	14	12	26	Aug. 19	.....	....
Private.....	Wm. Williams	14	12	26	Aug. 19	.....	....
Private.....	W. H. Hotaling	15	11	26	Aug. 19	.....	1
Private.....	W. C. Crosby	16	10	26	Aug. 19	.....	....
Private.....	W. E. Hoag	16	10	26	Sept. 14	.....	1
Private	Geo. Lawton	16	10	26	Aug. 19	.....	2
Private	Geo. Wheeler	8	17	25	Sept. 14	.....	1
Private.....	F. Burger	11	14	25	Oct. 12	.....	....
Private	W. I. DeWitt	11	14	25	Aug. 19	.....	3
Private	T. B. Frear	11	14	25	Aug. 19	.....	....
Corporal.....	J. S. Payntar	12	13	25	Oct. 12	.....	4
Private.....	J. D. Fleming	12	13	25	Oct. 12	.....	1
Private.....	J. R. Kenyon	12	13	25	Sept. 14	.....	2
Private.....	J. G. Westbrook	12	13	25	Sept. 14	.....	1
Private.....	E. Fowler	13	12	25	Aug. 19	.....	1
Corporal.....	C. B. Stow	14	11	25	Sept. 14	.....	2
Private.....	W. C. Preston	14	11	25	Oct. 12	.....	....
Private.....	C. W. Greene	15	10	25	Oct. 12	.....	....
Private.....	C. M. King	17	8	25	Aug. 19	.....	2

Total..... 42

FIFTEENTH SEPARATE COMPANY.

(Figure of merit.....10.86.)

RANK.	Name.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Captain.....	B. Meyers	22	15	37	Sept. 6	.....	9
Private	J. F. Fetter	17	12	29	Sept. 6	.....	....
Corporal.....	James Rose	16	10	26	Sept. 6	.....	....
Private	G. F. Allen	17	8	25	Sept. 6	.....	....

Total..... 4

SIXTEENTH SEPARATE COMPANY.

(Figure of merit.....52.39.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	H. Nichlewicz*	20	23	43	Oct. 7	C. M. C.	3
Private	D. H. Botsford	20	17	37	Aug. 20		1
Corporal	Thomas Jackson	16	17	33	Aug. 20		
Private	G. F. Tolley	18	15	33	Aug. 20		
First Sergt	P. Smith	16	16	32	Aug. 20		5
Private	H. J. Jones	14	17	31	Aug. 20		1
Private	A. Winkler	15	15	30	Aug. 20		
Private	T. E. Jones	17	13	30	Aug. 20		1
Private	W. A. Pennoyer	18	12	30	Aug. 20		2
Sergeant	L. W. Richardson	13	14	27	Aug. 20		
Captain	A. M. Murphy	14	13	27	Aug. 20		2
Private	F. C. Whitmarsh	14	12	26	Aug. 20		
Private	H. B. Wilcox	16	10	26	Aug. 20		
Private	A. P. Cammer	17	9	26	Aug. 20		
Private	J. F. Roe	9	16	25	Aug. 20		
Private	G. A. English	12	13	25	Aug. 20		
Sergeant	C. A. Spencer	18	7	25	Aug. 20		5
Private	C. R. Vroman	19	6	25	Aug. 20		1
Corporal	F. E. Van Gorden	21	4	25	Oct. 7	C. M. C.	1

Total..... 19

EIGHTEENTH SEPARATE COMPANY.

(Figure of merit..... 89.51.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
First Lieut	F. B. Streeter (Asst. Surg.)*	21	22	43	Oct. 7		
Corporal	J. E. Wildey*	22	21	43	Sept. 22		4
Captain	J. S. Garrett*	22	20	42	Sept. 22		6
Sergeant	E. D. Joyce	20	21	41	Sept. 10		3
First Sergt	W. B. Stevens	20	19	39	Sept. 10		5
Corporal	E. B. Roselle	21	18	39	Sept. 22		4
First Lieut	J. H. Leonard	20	18	38	Sept. 17		6
Private	W. S. Smith	16	21	37	Sept. 10		
Corporal	A. Lambert	17	20	37	Sept. 10		3
Corporal	W. H. White	16	20	36	Sept. 10		3
Private	A. Mead	16	20	36	Sept. 17		4
Private	F. Kirkham	18	18	36	Sept. 10		
Private	G. H. Rogers	18	18	36	Sept. 10		3
Corporal	C. M. Lent	19	17	36	Sept. 17		8
Private	J. Mott	16	19	35	Sept. 17		
Private	F. C. Dickinson	17	18	35	Sept. 22		2
Corporal	S. A. Powers	18	17	35	Sept. 22		
Private	J. H. Story	19	16	35	Sept. 22		
Private	D. D. Austin	15	19	34	Sept. 10		2
Private	J. H. Conway	16	18	34	Sept. 10		1
Private	J. Millard	19	15	34	Sept. 10		4
Private	F. Davis	21	13	34	Sept. 10		2
Q. M. Sergt	F. B. Brown	16	17	33	Sept. 10		3
Private	C. Hartman	17	16	33	Sept. 26		
Private	L. L. Chase	18	15	33	Sept. 10		
Second Lieut	J. W. Reed	19	13	32	Sept. 17		1
Private	C. F. Stone	13	18	31	Sept. 10		1
Private	D. Barton	16	15	31	Sept. 10		2

EIGHTEENTH SEPARATE COMPANY — *(Concluded).*

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	J. C. McCaghry	13	17	30	Sept. 26		
Private	W. R. Bullard	15	15	30	Sept. 10		
Private	C. E. Clark	15	15	30	Sept. 10		
Private	F. Kenyon	16	14	30	Sept. 10		
Sergeant	D. Fitzgerald	17	13	30	Sept. 17		7
Sergeant	J. H. Stewart	17	13	30	Sept. 17		3
Private	E. McP. Ames	18	12	30	Sept. 10		
Corporal	G. A. Van Heusen	15	13	28	Sept. 10		3
Private	C. W. Skyne	17	11	28	Sept. 10		
Sergeant	W. E. Smith	18	10	28	Sept. 17		3
Private	W. A. Bemis	13	14	27	Sept. 10		3
Private	A. A. Kingsley	13	14	27	Sept. 10		
Private	L. L. Davis	14	13	27	Sept. 10		
Private	F. C. West	16	11	27	Sept. 26		2
Private	W. F. Carter	11	15	26	Sept. 17		2
Private	E. Hurtibus	14	12	26	Sept. 26		
Corporal	E. J. Gray	16	10	26	Sept. 17		3
Private	J. M. Patterson	17	9	26	Sept. 10		2
Private	J. C. Smith	18	8	26	Sept. 10		4
Private	C. Rising	12	13	25	Sept. 10		
Private	L. L. Pickins	16	9	25	Sept. 26		

Total ..... 49.

NINETEENTH SEPARATE COMPANY.

(Figure of merit..... 56.62.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	Charles Guffo	21	20	41	Aug. 17		4
First Sergt.	J. G. L. Capron	17	20	37	Aug. 17		9
Second Lieut.	M. L. Bentell	22	14	36	Nov. 8		10
Private	F. W. Wheeler	15	19	34	Aug. 17		2
Sergeant	P. W. Hoffman	15	18	33	Nov. 8		9
Private	G. Wæchter	13	19	32	Aug. 31		2
Private	F. W. Curtis	14	18	32	Aug. 17		4
Private	J. J. Wakelee	18	14	32	Nov. 4		
Private	W. H. Cook	19	13	32	Aug. 17		1
Private	W. D. Earl	12	19	31	Aug. 31		
Sergeant	W. D. Bahret	16	15	31	Aug. 17		6
Private	V. Briggs	16	15	31	Aug. 31		7
Private	James Statter	18	13	31	Nov. 4		2
Private	W. C. Graham	12	18	30	Aug. 17		2
Private	F. A. Keller	16	14	30	Aug. 31		3
Private	C. C. MacNiel	18	12	30	Aug. 31		2
Corporal	M. J. Hennessy	19	11	30	Aug. 17		4
Corporal	G. M. Slater	19	11	30	Aug. 17		3
Private	H. M. Ruffle	15	14	29	Aug. 17		2
Captain	William Haubennestel	16	13	29	Aug. 17		10
Private	A. G. Corcoran	16	13	29	Aug. 31		3
Private	J. W. Banker	12	16	28	Aug. 17		
Private	M. T. Baumbush	15	13	28	Aug. 31		2
Private	C. A. Bodenstein	15	13	28	Aug. 17		
Private	J. H. Kirchoff	16	12	28	Aug. 17		2
Private	L. J. Osborn	16	12	28	Aug. 31		8
Private	A. M. Arnold	11	16	27	Aug. 17		
Private	F. H. Brower	12	15	27	Aug. 31		2

NINETEENTH SEPARATE COMPANY — *(Concluded).*

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	E. J. Corcoran	13	14	27	Nov. 8		
Private	A. A. Slater	14	13	27	Nov. 4		3
Private	R. Brown	15	12	27	Nov. 8		
Private	B. F. Wylie	15	12	27	Aug. 17		1
Private	W. H. Weaver	19	8	27	Aug. 17		7
Private	A. Morse	11	15	26	Aug. 17		1
Private	James Dillon	12	14	26	Nov. 8		1
Private	D. L. Malachowsky	14	12	26	Aug. 31		2
Private	F. J. Parks	15	11	26	Aug. 31		1
Private	G. E. Rust	15	11	26	Aug. 17		2
Private	M. Lenahan	12	13	25	Aug. 17		1
First Lieut	L. P. Haubennestel	13	12	25	Aug. 17		4
Private	J. H. Morrow	14	11	25	Aug. 17		2
Private	O. T. Way	14	11	25	Aug. 17		1
Private	J. M. Corcoran	15	10	25	Aug. 31		2
Private	James Maguire	15	10	25	Aug. 31		1
Private	F. L. Roosevelt	15	10	25	Aug. 17		
Private	T. F. Murphy	16	9	25	Aug. 31		
Private	E. M. Vail	16	9	25	Aug. 17		2
Private	W. E. Weaver	18	7	25	Aug. 17		1
Private	E. W. Walker	18	7	25	Aug. 17		3

Total 49

TWENTIETH SEPARATE COMPANY.

(Figure of merit ..... 70.56.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	D. H. Ogden*	22	25	47	Sept. 23	C. M. C.	9
Sergeant	T. M. Congdon*	19	24	43	Oct. 6	C. M. C.	9
First Sergt	C. H. Hitchcock*	21	22	43	Oct. 6	C. M. C.	4
Private	A. Bavier*	21	22	43	Oct. 8	C. M. C.	6
First Lieut	D. S. Burr (Asst. Surg.)	19	22	41	Oct. 6	C. M. C.	3
Private	C. E. Hinds	19	20	39	Oct. 20		3
Private	W. S. McKenney	18	20	38	Oct. 20		
Private	B. Fellows	21	17	38	Oct. 27		2
Private	J. S. Smith	16	19	35	Oct. 20		
Second Lieut	F. D. Lyon	17	18	35	Nov. 2		7
Private	G. W. Church	18	17	35	Oct. 20		
Corporal	H. B. Halstead	19	15	34	Oct. 27		2
Private	J. Dimmick	20	14	34	Sept. 21		
Private	C. H. Benson	15	18	33	Oct. 20		
Private	John Townsend	18	15	33	Oct. 27		2
Corporal	G. C. Harris	12	20	32	Oct. 20		1
Captain	H. C. Rogers	16	16	32	Oct. 20		3
Corporal	F. A. L'Amoreux	18	14	32	Oct. 20		2
Private	J. P. Worthing	19	13	32	Oct. 20		11
Private	J. Troy	14	16	30	Oct. 20		
Sergeant	H. P. Worthing	15	15	30	Oct. 20		2
Sergeant	W. W. Storr	16	14	30	Oct. 20		4
Private	R. A. Binek	16	14	30	Oct. 20		
Private	E. M. Roberts	16	14	30	Oct. 27		
Private	Harry Acker	12	17	29	Oct. 27		1
Private	P. J. McNamara	13	16	29	Oct. 27		
Private	J. D. Starr	18	11	29	Oct. 27		1
Corporal	F. C. Williams	13	15	28	Oct. 20		1
Private	T. L. Magrath	14	14	28	Oct. 27		

TWENTIETH SEPARATE COMPANY — *(Concluded).*

RANK.	Name.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	W. Tupper	16	12	28	Oct. 27		
Private	W. V. Parke	19	9	28	Oct. 20		
First Lieut	C. F. Tupper	13	14	27	Oct. 20		8
Private	A. St. J. Cummings	13	14	27	Oct. 27		
Private	H. Schad, Jr	20	7	27	Oct. 27		1
Private	J. H. Herald	12	14	26	Oct. 20		
Private	B. A. Read	19	7	26	Oct. 20		
Private	F. J. Whittaker	12	13	25	Oct. 20		
Private	F. R. Campbell	13	12	25	Oct. 20		1
Private	C. Hoke	13	12	25	Oct. 27		
Private	B. A. Robinson	13	12	25	Oct. 27		1
Corporal	G. O. Engelbrecht	14	11	25	Oct. 20		1
Private	F. W. Harris	18	7	25	Oct. 20		1

Total ..... 42.

TWENTY-FIRST SEPARATE COMPANY.

(Figure of merit ..... 43.59)

RANK.	Name.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	F. Prendergast	18	20	38	July 29		
Private	W. L. Thompson	17	20	37	July 29		
Private	C. W. Adams	18	19	37	July 29		
Private	L. D. Hunt	18	18	36	July 29		1
Private	A. Deihl	19	13	32	July 29		
Private	J. P. Lovegroove	18	13	31	July 29		
Private	G. W. Hewitt	17	13	30	July 29		
Private	W. H. Allendorph	16	13	29	July 29		
First Sergt	M. Sullivan	17	12	29	July 29		3
Q. M. Sergt	J. C. Schutt	18	11	29	July 29		2
Private	E. M. Felter	15	13	28	July 29		1
Second Lieut	M. Dunspaugh	16	12	28	July 29		2
Private	D. Richer	16	12	28	July 29		
Private	F. H. Karr	18	10	28	July 29		
Private	G. E. Cook	14	13	27	July 29		
Corporal	E. W. Bond	16	11	27	July 29		2
Private	T. C. Ives	18	9	27	July 29		
Private	W. Thayer	18	9	27	July 29		
Private	W. A. Slocum	19	8	27	July 29		1
Private	H. L. Evarts	12	14	26	July 29		1
Corporal	R. G. Conklin	14	12	26	July 29		2
Private	F. G. Butterworth	16	10	26	July 29		
Private	F. McMahon	16	9	25	July 29		
Private	F. Schutt	16	9	25	July 29		1
Private	Ira De Long	17	8	25	July 29		1

Total 25

TWENTY-SECOND SEPARATE COMPANY.

(Figure of merit.....47.78)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Second Lieut.	W. L. Rich	19	17	36	Oct. 4		1
Private	A. H. Wilde	20	14	34	Oct. 4		3
Private	A. L. Churchill	14	19	33	Oct. 4		2
Private	H. L. Waterbury	14	18	32	Oct. 4		1
Corporal	J. N. Crocker, Jr.	19	12	31	Oct. 4		1
Private	R. Mingay, Jr	20	11	31	Oct. 4		
Captain	R. C. McEwen	15	15	30	Oct. 4		2
Corporal	M. H. Wooster	17	12	29	Oct. 4		
Private	D. W. Condery	15	13	28	Oct. 4		
Private	W. W. Benton	16	12	28	Oct. 4		
Private	W. G. Groat	16	12	28	Oct. 4		
Private	J. W. Lyman	17	10	27	Oct. 4		
Sergeant	J. H. Reagan	18	9	27	Oct. 4		
Private	J. W. Lester	12	14	26	Oct. 4		1
Private	W. S. Poler	17	9	26	Oct. 4		4
Corporal	A. C. Rich	13	12	25	Oct. 4		1
First Lieut	A. L. Hall	15	10	25	Oct. 4		1
Private	R. C. Fonda	15	10	25	Oct. 4		
Private	L. R. Rich	15	10	25	Oct. 4		2

Total..... 19

TWENTY-THIRD SEPARATE COMPANY.

(Figure of merit..... 62.05.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	D. W. Bugel*	23	20	43	Oct. 13	C. M. C.	8
Corporal	J. T. B. Bogardus*	21	21	42	Oct. 13	C. M. C.	2
Private	R. C. Payne*	22	20	42	Oct. 13	C. M. C.	3
Corporal	R. V. Noble	17	21	38	Oct. 7	C. M. C.	2
First Lieut	R. Reynolds	19	19	38	Sept. 23		8
Private	H. S. Rivanburgh	18	19	37	Sept. 23		1
Private	C. E. Benedict	19	16	35	Sept. 23		1
Private	J. Philip, Jr	16	17	33	Sept. 23		
Private	G. Schwegler, Jr	19	14	33	Sept. 23		2
Private	C. E. Wilcox	19	14	33	Sept. 23		2
Corporal	T. W. Nicholson	15	16	31	Sept. 23		3
Private	E. Newcomb	17	14	31	Sept. 23		
Sergeant	F. W. Macy	14	16	30	Sept. 23		6
Private	N. Klein	13	16	29	Oct. 7	C. M. C.	
Private	C. B. Macy	19	10	29	Sept. 23		3
Private	E. L. Nicholson	14	14	28	Sept. 23		1
Private	J. C. Frero	15	13	28	Sept. 23		1
Second Lieut.	H. Waterman	16	12	28	Sept. 23		1
Corporal	W. I. Gray	16	12	28	Sept. 23		3
Private	C. L. Buckman	18	10	28	Sept. 23		1
Private	B. H. Kennedy	19	9	28	Sept. 23		3
Private	C. C. Tough	16	11	27	Sept. 23		
Sergeant	L. H. George	19	8	27	Sept. 23		7
Sergeant	M. Van de Bogart	13	13	26	Nov. 3	C. M. C.	1
Q. M. Sergt.	C. F. F. Beale	14	12	26	Sept. 23		
Private	A. F. Bogardus	14	12	26	Sept. 23		
Private	G. E. Swift	15	11	26	Sept. 23		3

TWENTY-THIRD SEPARATE COMPANY — *(Concluded).*

RANK.	Name.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	F. Fanand	17	9	26	Sept. 23		1
Private	R. W. Evans	18	8	26	Nov. 3	C. M. C.	3
First Lieut	C. E. Fritts (Asst. Surg.)	20	6	26	Sept. 23		8
Private	L. R. Tilden	14	11	25	Sept. 23		3
Corporal	H. D. Van Vleck	17	8	25	Nov. 3	C. M. C.	1
Private	L. H. Payne	18	7	25	Sept. 23		

Total..... 33.

TWENTY-FOURTH SEPARATE COMPANY.

(No practice.)

TWENTY-SEVENTH SEPARATE COMPANY.

(Figure of merit..... 65.84.)

RANK.	Name.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Corporal	W. H. Arnold*	20	22	42	July 13		3
Sergeant	S. E. Gregg	19	20	39	July 13		3
Sergeant	F. M. Heath	19	15	34	July 13		3
Private	C. H. Bradley	16	17	33	July 13		1
Private	C. J. Ferris	19	13	32	July 13		
Private	W. L. Markel	11	19	30	Oct. 11		2
Private	C. N. Roby	13	17	30	Oct. 11		2
Sergeant	F. C. Norris	16	13	29	July 13		2
Private	C. F. Fury	16	13	29	July 13		
Private	J. Ide	18	11	29	Oct. 11		
Second Lieut.	W. H. Plumb	20	9	29	July 13		2
Private	G. H. French	5	23	28	July 13		3
Private	A. U. Grant	12	16	28	July 13		
Private	W. L. Peterson	12	16	28	July 13		
Sergeant	G. W. Crooks	14	14	28	July 13		3
Private	F. D. Allen	15	13	28	Oct. 11		1
Private	C. D. Bruce	15	13	28	Oct. 11		1
Corporal	J. A. Plumb	18	10	28	July 13		2
Private	J. A. Campbell	19	9	28	Oct. 11		1
Private	E. L. Ayer	17	10	27	Oct. 11		1
Private	O. C. Saunders	19	8	27	Oct. 11		
Private	F. B. Dow	12	14	26	Oct. 11		
Private	I. A. Jameson	14	12	26	July 13		
Corporal	R. M. York	15	11	26	July 13		
Corporal	G. E. Cooley	16	10	26	Oct. 11		3
Private	A. J. Miller	18	8	26	Oct. 11		
Private	E. E. Moore	13	12	25	July 13		1
First Sergt.	M. W. Hutchings	14	11	25	July 13		3
Private	W. P. Badger	15	10	25	July 13		
Private	B. R. Shears	15	10	25	Oct. 11		1
Private	F. J. Carr	18	7	25	July 13		1

Total..... 31

TWENTY-EIGHTH SEPARATE COMPANY.

(No practice.)

THIRTY-FIRST SEPARATE COMPANY.

(Figure of merit..... 26.13.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
First Sergt...	F. H. Sayles	17	21	38	Aug. 13		2
Private.....	L. N. Walker	17	21	38	Aug. 13		4
Private.....	R. D. Winnegar	15	20	35	Aug. 13		4
Private.....	G. P. Rasbach	17	17	34	Aug. 13		3
Private.....	J. Dewell	19	15	34	Sept. 3		1
Private.....	O. Horton	18	15	33	Aug. 13		3
Private.....	W. Whitfield	19	14	33	Sept. 17		2
Private.....	R. R. Wightman	21	12	33	Sept. 17		....
Sergeant.....	I. F. Small	18	14	32	Sept. 10		1
Private.....	J. W. Johnson	20	12	32	Sept. 17		....
Private.....	Wm. Eddy	21	11	32	Aug. 13		....
Private.....	Theo. Desermoux	13	18	31	Aug. 13		....
Private.....	Wm. Bedworth	17	14	31	Sept. 3		4
Sergeant.....	C. T. Thrall	19	12	31	Sept. 10		2
Private.....	E. Fulmer	19	12	31	Sept. 17		....
Corporal.....	C. E. Varley	13	17	30	Sept. 17		1
Private.....	A. F. Billinger	14	16	30	Sept. 17		1
Sergeant.....	J. W. Gleed	19	11	30	Sept. 10		....
First Lieut...	D. M. Dodge	21	9	30	Sept. 3		3
Q. M. Sergt...	H. D. Happener	11	18	29	Aug. 13		1
Second Lieut.	J. M. Billinger	15	13	28	Aug. 13		3
Private.....	F. Arthur	16	11	27	Aug. 13		....
Corporal.....	Wm. Lamb	18	9	27	Sept. 17		1
Private.....	T. Colman	15	11	26	Sept. 17		....
Private.....	P. H. Steele	8	17	25	Sept. 17		....
Captain.....	A. J. Budlong	12	13	25	Sept. 10		1
Private.....	Chas. Graves	16	9	25	Sept. 10		....

Total..... 27.

THIRTY-SECOND SEPARATE COMPANY.

(Figure of merit..... 61.21.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private.....	H. Palmer*	23	20	43	Oct. 11		1
Corporal.....	F. A. Rich	21	18	39	Oct. 11		1
First Sergt...	Yates Van Evera	19	19	38	Oct. 3		1
Private.....	W. F. Healey	20	18	38	Oct. 3		1
Sergeant.....	B. Willis	19	18	37	Oct. 11		....
Corporal.....	A. Willis	19	17	36	Oct. 11		1
Captain.....	C. W. Eddy	19	16	35	Oct. 11		2
Second Lieut.	G. W. Walden	19	16	35	Oct. 11		1
Private.....	Thos. Mitchell	21	12	33	Oct. 11		....
Private.....	C. C. Milliken	18	13	31	Oct. 3		1
Private.....	C. Palmer	19	12	31	Oct. 11		....
Private.....	C. E. Beattie	20	11	31	Oct. 11		1
Private.....	G. B. Gifford	13	17	30	Oct. 3		....
Private.....	H. W. Le Barron	17	13	30	Oct. 11		....
Sergeant.....	R. L. Perry	20	10	30	Oct. 11		1

THIRTY-SECOND SEPARATE COMPANY — *(Concluded).*

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 Yards.	500 Yards.	Total.			
Private	Chas. Bush	14	15	29	Oct. 3		1
Private	W. H. Kelley	15	14	29	Oct. 3		....
Private	W. P. Haynes	16	13	29	Oct. 3		....
Private	Chas. Stewart	16	13	29	Oct. 11		....
Private	Ira Willis, Jr.	16	13	29	Oct. 11		....
Private	F. G. Siebolt	18	11	29	Oct. 11		....
Private	F. Kincaid	19	10	29	Oct. 3		....
Corporal	J. J. Deming	16	12	28	Oct. 3		1
Private	C. R. Gifford	17	11	28	Oct. 11		....
Private	A. F. McLean	18	10	28	Oct. 11		....
Private	F. C. Pitney	18	10	28	Oct. 11		....
Private	Chas. Close	13	14	27	Oct. 3		....
Private	R. J. Redfield	13	14	27	Oct. 11		....
Private	F. W. Gifford	15	12	27	Oct. 3		....
First Lieut	F. L. Stevens	16	11	27	Oct. 3		....
Private	John Mead	17	10	27	Oct. 3		....
Private	G. W. Siebolt	17	10	27	Oct. 11		....
Corporal	E. C. Byers	18	9	27	Oct. 3		1
Private	J. B. Bickford	13	13	26	Oct. 3		1
Private	Edw. Thomas	13	13	26	Oct. 11		....
Private	F. E. Baker	14	12	26	Oct. 3		....
Private	W. A. Johnson, Jr.	14	12	26	Oct. 3		1
Private	W. F. Montgomery	14	12	26	Oct. 3		....
Private	T. Russell	14	12	26	Oct. 11		....
Corporal	W. H. Beckett	15	11	26	Oct. 3		....
Private	B. W. Sugden	15	11	26	Oct. 11		....
Private	C. G. Perry	16	10	26	Oct. 11		....
Private	Jas. Bryant	17	9	26	Oct. 3		1
Private	A. F. Biggort	17	9	26	Oct. 3		....
Private	J. W. Martin	17	9	26	Oct. 3		1
Private	A. J. Sippesley	17	9	26	Oct. 11		....
Corporal	William Bryant	19	7	26	Oct. 11		1
Private	E. C. Davis	19	7	26	Oct. 11		....
Corporal	E. B. Rafter	20	6	26	Oct. 3		1
Private	James Mead	12	13	25	Oct. 3		....
Private	P. F. Barber	14	11	25	Oct. 3		....
Private	C. A. Folland	14	11	25	Oct. 3		1
Private	Edw. Gill	14	11	25	Oct. 3		....
Private	William Paul	14	11	25	Oct. 3		....
Sergeant	J. A. Blake	15	10	25	Oct. 3		....
Private	W. R. Smith	15	10	25	Oct. 11		....
Private	G. L. Freemyer	16	9	25	Oct. 3		1
Private	C. F. Hisert	16	9	25	Oct. 3		....
Private	F. T. Sibley	16	9	25	Oct. 11		....
Q. M. Sergt	J. M. Closson	18	7	25	Oct. 3		....
Private	W. A. Link	18	7	25	Oct. 3		....
Private	H. Corbin	19	6	25	Oct. 3		1

Total 62

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THIRTY-THIRD SEPARATE COMPANY.

(Figure of merit..... 70.19.)

RANK.	Name.	SCORES.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
First Sergt ...	D. E. McLean*	21	21	42	Sept. 28	.....	5
Corporal.....	C. W. Beers	21	20	41	Sept. 21	.....	6
Private	W. H. McCall	21	18	39	Oct. 19	.....	3
Private	L. P. Chamberlin	18	18	36	June 28	.....	....
Private	W. S. Whitcomb	18	18	36	Oct. 26	.....	1
Private	E. Houghtaling	19	17	36	Sept. 9	.....	....
Private	J. W. St. John	17	18	35	Nov. 2	.....	....
Private	J. C. Martin	18	17	35	Oct. 19	.....	....
Sergeant	G. B. Gray	19	15	34	Nov. 2	.....	5
Sergeant	T. A. Pine	20	14	34	Oct. 15	.....	6
Private	W. L. Franer	19	14	33	June 28	.....	6
Second Lieut.	G. C. Robinson	13	19	32	Oct. 29	.....	6
Private	W. W. Collett	16	16	32	Oct. 29	.....	....
Private	E. H. Hanford	18	14	32	Oct. 15	.....	1
Private	O. A. Brisco	19	13	32	Nov. 8	.....	3
Q. M. Sergt...	George Patchen	14	17	31	July 5	.....	5
Private	D. E. Pierce	19	12	31	Oct. 26	.....	1
Corporal.....	D. W. Benedict	20	11	31	Oct. 19	.....	4
Private	L. C. Rosa	13	17	30	Sept. 28	.....	1
Private	F. D. Wakeman	13	17	30	Oct. 22	.....	2
Private	E. E. Robinson	15	15	30	Oct. 26	.....	2
Private	O. W. Fox	17	13	30	June 28	.....	3
Private	J. H. McCall	19	11	30	Oct. 15	.....	....
Corporal.....	F. E. Marvin	17	12	29	Sept. 21	.....	2
Private	C. E. Beers	17	12	29	Oct. 22	.....	....
Private	F. A. Pine	14	14	28	Oct. 26	.....	....
Private	H. C. Pine	16	12	28	Aug. 10	.....	....
Private	H. S. Sewell	16	12	28	July 20	.....	1
Captain.....	W. W. Marvin	21	7	28	July 28	.....	7
Private	F. G. Howland	21	7	28	Oct. 19	.....	3
Corporal.....	R. W. McLanny	12	15	27	Nov. 9	.....	....
First Lieut ..	H. B. Moremus	13	14	27	June 28	.....	4
Private	S. L. Twist	12	14	26	Oct. 26	.....	....
Corporal.....	N. S. Rosa	14	12	26	June 28	.....	2
Private	D. T. Borden	14	12	26	July 5	.....	2
Corporal.....	W. A. McLean	15	11	26	Oct. 26	.....	5
Private	L. Beardslee	15	11	26	Aug. 17	.....	2
Private	C. H. Vandervort	15	11	26	Oct. 25	.....	1
Private	C. F. Smith	16	10	26	Aug. 3	.....	3
Private	M. V. White	17	9	26	June 28	.....	1
Private	J. J. Rosa	8	17	25	Sept. 9	.....	1
Private	I. E. Robinson	11	14	25	Oct. 26	.....	....
Private	C. H. Waring	12	13	25	Oct. 26	.....	1
Private	J. C. Smith	21	4	25	Oct. 19	.....	1

Total..... 44.

THIRTY-FIFTH SEPARATE COMPANY.

(Figure of merit.....51.76.)

RANK.	Name.	SCORES.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Q. M. Sergt...	W. H. Proctor	17	18	35	Aug. 31	.....	1
Private.....	J. E. McKee.....	16	18	34	Aug. 31	.....	....
First Sergt....	D. B. Lucey.....	19	14	33	Oct. 28	.....	....
Corporal.....	F. N. Bradley.....	17	15	32	Aug. 31	.....	....
Corporal.....	A. D. Stetson.....	14	17	34	Aug. 31	.....	....
Private.....	J. Samrie.....	16	15	31	Oct. 28	.....	....
Private.....	H. Z. Austin.....	18	13	31	Aug. 31	.....	1
Private.....	C. N. Lewis.....	18	13	31	Aug. 31	.....	....
Sergeant.....	E. S. Brown.....	19	12	31	Oct. 28	.....	....
Private.....	M. T. Panguette.....	19	11	30	Oct. 28	.....	....
Corporal.....	C. E. Cooper.....	15	14	29	Oct. 28	.....	....
Sergeant.....	J. L. Barnett.....	16	13	29	Aug. 31	.....	....
Private.....	W. H. Furnils.....	18	11	29	Aug. 9	.....	....
Private.....	H. A. Crord.....	19	10	29	Oct. 28	.....	....
Corporal.....	E. C. J. Smith.....	12	16	28	Aug. 31	.....	....
Private.....	N. H. J. Lytle.....	12	16	28	Aug. 31	.....	....
Private.....	E. H. Earl.....	13	15	28	Aug. 31	.....	....
Private.....	H. B. Overton.....	13	15	28	Aug. 31	.....	....
Private.....	J. F. Cady.....	15	13	28	Aug. 31	.....	1
Private.....	G. Earl.....	15	13	28	Aug. 31	.....	....
Private.....	F. N. Thompson.....	15	13	28	Aug. 31	.....	....
Second Lieut.	L. M. Proctor.....	17	11	28	Aug. 31	.....	1
Corporal.....	J. B. Pettibone.....	20	8	28	Oct. 28	.....	....
Private.....	W. H. Godden.....	14	13	27	Oct. 28	.....	....
Private.....	M. D. Kelly.....	9	17	26	Aug. 31	.....	....
Private.....	J. Frank.....	14	12	26	Oct. 28	.....	....
Private.....	J. B. Tuck.....	14	12	26	Oct. 28	.....	....
Private.....	A. F. Butterfield.....	14	11	25	Aug. 31	.....	....
Private.....	F. J. Donohue.....	14	11	25	Oct. 28	.....	....
Private.....	I. L. Wells.....	15	10	25	Aug. 31	.....	1
Private.....	Edward McVean.....	16	9	25	Aug. 31	.....	1
Captain.....	Henry Holland.....	17	18	25	Aug. 31	.....	....
First Lieut...	J. W. Benton (Asst. Surg.).....	17	18	25	Oct. 28	.....	....

Total..... 33

THIRTY-SIXTH SEPARATE COMPANY.

(Figure of merit.....36.38.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
First Sergt ...	J. H. Smith	15	20	35	Aug. 9	.....	3
First Lieut ...	W. T. Clute (Asst. Surg.)	16	17	33	Aug. 9	.....	1
First Lieut ...	J. F. White	15	17	32	Aug. 9	.....	3
Private	P. Cook	17	15	32	Aug. 9	.....	1
Corporal.....	William Vrooman	13	18	31	Aug. 9	.....	....
Private	P. Brogan	14	17	31	Aug. 9	.....	....
Private	R. Barhydt	16	14	30	Nov. 1	.....	....
Corporal.....	W. H. Spencer	17	13	30	Aug. 9	.....	3
Q. M. Sergt...	W. H. Gray	14	14	28	Aug. 9	.....	1
Private	W. S. Mischler	12	15	27	Aug. 9	.....	....
Sergeant	J. C. Kotz	14	13	27	Nov. 1	.....	....
Private	N. Swart	16	11	27	Nov. 1	.....	....
Private	J. McC. Paige	13	13	26	Aug. 9	.....	4
Private	Charles Ott	14	12	26	Nov. 1	.....	....
Private	E. McDonald	15	11	26	Nov. 1	.....	....
Private	W. Veeder	12	13	25	Nov. 1	.....	....
Sergeant	John Robinson	13	12	25	Aug. 9	.....	4

Total..... 17

THIRTY-SEVENTH SEPARATE COMPANY.

(Figure of merit..... 52.85.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	F. P. Reeves	16	22	38	Aug. 10	.....	....
Private	C. W. Vanderveer	19	19	38	Nov. 1	.....	1
Private	E. F. Garling	17	20	37	Aug. 10	.....	....
Private	A. G. Veeder	19	18	37	Aug. 10	.....	....
Sergeant	G. E. Tator	15	20	35	Aug. 10	.....	....
Private	E. W. Veeder	15	20	35	Aug. 10	.....	....
Private	J. E. Lathers	12	22	34	Aug. 10	.....	2
Private	G. W. Cary	20	14	34	Aug. 10	.....	1
Private	D. S. Voorhees	16	17	33	Nov. 1	.....	....
Sergeant	W. Chubb	19	14	33	Nov. 1	.....	1
Corporal.....	E. P. Towne	14	18	32	Aug. 10	.....	....
Private	F. Bander	16	14	30	Aug. 10	.....	....
Q. M. Sergt...	S. W. Groot	12	17	29	Aug. 10	.....	....
First Sergt ...	J. J. Wheaton	14	15	29	Aug. 10	.....	....
Private	W. Briggs	18	11	29	Aug. 10	.....	....
Corporal.....	E. Hagen	19	10	29	Aug. 10	.....	....
Corporal.....	C. H Luffman	15	13	28	Aug. 10	.....	....
Private	P. Bernardi	16	12	28	Aug. 10	.....	....
Captain.....	G. W. Marlette	13	14	27	Aug. 10	.....	....
Private	A. J. Dillingham	15	12	27	Aug. 10	.....	....
Private	N. W. Rosa	15	12	27	Aug. 10	.....	....
Private	E. J. Jeffries	16	11	27	Nov. 1	.....	1
Second Lieut.	J. H. Vedder	17	10	27	Aug. 10	.....	....
Corporal.....	Sam Bond	17	10	27	Nov. 1	.....	....
Private	Charles Cain	16	10	26	Nov. 1	.....	1
Private	H. J. Estcourt	20	6	26	Aug. 10	.....	1
Sergeant	W. W. Weller, Jr.	12	13	25	Aug. 10	.....	....
Private	G. Winans	14	11	25	Aug. 10	.....	....
Private	J. H. Shaffer	15	10	25	Nov. 1	.....	1
Sergeant	S. Schermerhorn	17	8	25	Nov. 1	.....	....

Total ..... 30.

THIRTY-NINTH SEPARATE COMPANY.

(Figure of merit..... 75.62.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Sergeant	J. S. Boyer*	21	24	45	July 11		6
First Sergt.	W. R. Zimmerman*	20	22	42	July 11		8
First Lieut.	M. S. Smith (Asst. Surg.)	20	21	41	Aug. 30		3
Corporal	W. N. Brown	21	20	41	July 11		3
Private	E. R. Brown	21	19	40	Aug. 30		2
Private	F. F. Sargent	19	20	39	July 11		
Private	J. W. Taggart	19	19	38	July 11		4
Private	J. F. Greene	17	20	37	Aug. 30		1
Corporal	G. F. Haskins	19	17	36	July 11		3
Private	B. C. Grommon	19	17	36	July 11		
Private	D. C. Middleton	19	17	36	July 11		1
Corporal	D. W. Cahill	20	16	36	July 11		2
Private	C. E. Jones	16	18	34	July 11		2
Second Lieut.	T. F. Kearns	18	16	34	July 11		5
Private	S. D. Rider	18	16	34	Aug. 30		
Private	W. S. Burt	19	15	34	July 11		
Private	W. B. Ball	19	15	34	July 11		1
Corporal	J. N. Carlisle	16	17	33	July 11		2
Private	F. E. Avery	17	16	33	July 11		1
Private	G. C. Baker	17	16	33	July 11		2
First Lieut.	W. W. Scott	19	14	33	Aug. 30		9
Private	E. H. Murray	19	14	33	Aug. 30		2
Corporal	J. C. Ayers	21	12	33	Aug. 30		3
Private	G. R. Clare	15	17	32	Aug. 30		
Q. M. Sergt.	E. C. Van Namee	18	14	32	July 11		4
Private	P. J. Baker	18	14	32	July 11		3
Private	E. G. Herrick	18	14	32	July 11		
Private	C. F. Baldwin	19	13	32	Aug. 30		1
Private	J. M. Cadwell	15	16	31	July 11		2
Private	A. Clark	15	16	31	July 11		3
Private	F. H. Relyea	12	18	30	July 11		
Private	J. T. Raplee	14	16	30	Aug. 30		2
Private	C. E. Ehrlicher	15	15	30	Aug. 30		2
Private	E. R. Hildreth	15	15	30	July 11		
Private	F. C. Cook	16	14	30	July 11		2
Private	E. R. Taylor	16	14	30	July 11		2
Private	B. A. Field	12	17	29	Aug. 30		
Private	F. F. York	14	15	29	Aug. 30		
Sergeant	C. R. Murray	15	14	29	July 11		5
Corporal	E. R. Wilcox	15	14	29	Aug. 30		2
Private	A. L. Keenan	16	13	29	Aug. 30		2
Private	C. A. House	17	12	29	July 11		
Private	G. W. Clodwick	18	11	29	July 11		1
Private	C. G. Stevens	13	15	28	July 11		
Private	J. H. Spratt	14	14	28	July 11		2
Sergeant	Sam Child	18	10	28	July 11		2
Private	C. E. Emerson	16	11	27	July 11		5
Private	H. H. Moriarty	16	11	27	July 11		
Private	J. N. Noble	16	11	27	July 11		2
Private	G. A. Tisdale	18	9	27	July 11		1
Private	W. B. Carlisle	19	8	27	July 11		2
Private	F. H. Lamon	16	10	26	Aug. 30		
Private	F. E. Taylor	16	10	26	July 11		2
Private	L. R. Washburn	17	9	26	Aug. 30		2
Private	L. J. Davis	19	7	26	July 11		
Private	W. J. Felt	11	14	25	July 11		
Private	H. P. Cooke	13	12	25	Aug. 30		1
Private	H. C. Whitney	15	10	25	Aug. 30		
Private	J. W. Loan	16	9	25	July 11		
Private	F. W. Streeter	17	8	25	Aug. 30		1
Private	J. S. Baird	18	7	25	July 11		

Total 61

SIXTH BATTERY.

(Figure of merit..... 22.93.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	L. F. Pitcher*	22	24	46	Nov. 3		
Captain	L. L. Olmsted	16	17	33	Nov. 2		
Private	F. McClure	16	17	33	Nov. 2		
Sergeant	J. H. Wood	20	13	33	June 30		
Private	F. Colstery	18	14	32	Nov. 2		
Private	J. E. Dunning	18	14	32	Nov. 2		
Private	A. B. Rover	15	16	31	Nov. 2		
Private	F. Whipple	15	16	31	Nov. 2		
Private	John Barnes	16	15	31	Nov. 2		
First Sergt.	A. J. Bush	17	14	31	Nov. 2		
Private	A. G. Breckenridge	14	16	30	Nov. 2		
Private	H. J. Smith	14	16	30	Nov. 2		
Second Lieut.	J. H. Gross	15	14	29	Nov. 3		
Private	R. H. Corbett	14	14	28	Nov. 2		
Private	W. E. Potter	13	14	27	Nov. 2		
Private	S. M. Rockwell	15	11	26	June 30		4
Private	J. Finnegan	17	9	26	Nov. 2		

Total 17

FOURTH BRIGADE.

(Figure of merit..... 54.31.)

GENERAL AND STAFF.

(Figure of merit..... 56.66.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 Yards.	500 Yards.	Total.			
Lieut. Col.	Charles Clifton (A. A. G.)	16	17	33	June 29		5
Major	Edw. Hayes	18	15	33	June 29		3
Major	A. H. G. Hardwicke	14	14	28	July 1	C. M. C.	1
Brig.-Gen	P. C. Doyle	18	10	28	July 21		
Major	S. E. Warren	13	14	27	Aug. 6	C. M. C.	5
Major	R. Park	17	10	27	July 15		3

Total 6

SIXTY-FIFTH REGIMENT.

(Figure of merit..... 51.64.)

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 Yards.	500 Yards.	Total.			
First Sergt....	John Maxwell*.....	I	20	23	43	Aug. 18	.....	4
First Sergt....	T. Quinlivan*.....	A	19	23	42	Aug. 18	.....	3
Corporal.....	F W. Messinger*.....	A	20	22	42	Aug. 18	.....	2
Corporal.....	R. E. Embliage*.....	F	23	19	42	Aug. 17	C. M. C.....	4
Captain.....	A. C. Lewis.....	I	16	22	38	Aug. 18	.....	5
First Lieut...	John Ratcliff.....	D	18	19	37	Aug. 25	.....	1
Sergeant	E. A. Smith.....	F	19	18	37	Aug. 25	.....	6
Private.....	John Mitchell.....	F	19	18	37	Aug. 25	.....	1
Captain.....	R. H. Montgomery.....	G	20	16	36	Aug. 8	.....	6
Sergeant	Charles Gebhard	F	19	16	35	Aug. 17	Fourth Brig.	4
Major.....	J. E. Robie	Field	20	15	35	Aug. 18	.....	4
Sergeant	F. E. Martin.....	B	12	22	34	Aug. 9	.....	2
Private.....	Charles Dean	C	17	17	34	Aug. 9	.....	3
Private.....	W. B. Brewer	A	19	15	34	Aug. 8	.....	3
Lieut.-Col	S. M. Welch, Jr....	F	20	14	34	Aug. 9	.....	8
Private.....	James Simmons.....	A	20	14	34	Aug. 18	.....	2
Private.....	E. E. Cronk.....	C	16	17	33	Aug. 9	.....	2
Corporal.....	M. W. Halblaub.....	A	15	17	32	Aug. 8	.....	3
Private.....	M. Wasser.....	D	15	17	32	Aug. 9	.....	8
Private.....	Charles Brown.....	H	17	15	32	Aug. 8	.....	....
Sergeant	G. J. Becker.....	G	19	13	32	Aug. 18	.....	4
Private.....	M. M. Beck	H	19	13	32	Aug. 18	.....	1
First Sergt...	R. Wahlstedt.....	D	14	17	31	Aug. 9	.....	1
Q. M. Sergt...	F. W. Elsaesser.....	F	14	17	31	Aug. 18	.....	6
Private.....	L. W. Diemer	B	14	17	31	Aug. 9	.....	....
Corporal.....	E. G. Hardy	H	16	15	31	Aug. 18	.....	3
Captain.....	W. T. Parsons.....	F	17	14	31	Aug. 18	.....	8
Private.....	C. E. Carlson	D	18	13	31	Aug. 25	.....	1
Private.....	James Elsaesser.....	F	18	13	31	Aug. 8	.....	2
Private.....	W. H. Stewart.....	B	10	20	30	Aug. 9	.....	1
Second Lieut.	E. S. De Forest.....	B	13	17	30	Aug. 9	.....	5
Captain.....	G. W. Patterson (Asst. S.).	Staff	14	16	30	Aug. 9	.....	5
First Lieut...	G. J. Metzger (Q. M.)	Staff	14	16	30	Aug. 8	.....	4
Captain.....	G. J. Haffa.....	A	15	15	30	Aug. 8	.....	....
Sergeant	W. F. Krueger	G	15	15	30	Aug. 25	.....	4
Private	A. Swanson	D	15	15	30	Aug. 9	.....	1
Captain.....	O. F. Langenbach	H	16	14	30	Aug. 18	.....	6
First Lieut ...	E. E. Seaman	G	16	14	30	Aug. 18	.....	1
Private	F. C. Dimick	G	16	14	30	Aug. 8	.....	....
Corporal.....	R. F. Westfall.....	I	17	13	30	Aug. 18	.....	1
Major.....	A. H. Briggs (Surg.).....	Staff.	19	11	30	Aug. 18	.....	5
Private	J. A. Ward	I	19	11	30	Aug. 9	.....	1
Second Lieut.	E. A. Hall	F	13	16	29	Aug. 8	.....	1
Private .....?	Frank Geiger.....	B	15	14	29	Aug. 9	.....	1
Private	R. H. Ewert	D	15	14	29	Aug. 25	.....	1
Private	G. A. Schmidt.....	F	15	14	29	Aug. 8	.....	2
Q. M. Sergt. ..	E. Baker.....	I	16	13	29	Aug. 25	.....	1
Private	C. A. Anderson, No. 1.....	D	16	13	29	Aug. 25	.....	1
Private	F. Morath	D	16	13	29	Aug. 9	.....	1
Captain.....	J. H. Swanson	D	17	12	29	Aug. 9	.....	5
Private	H. F. Holkmeyer	F	17	12	29	Aug. 25	.....	2
Sergeant	T. Brown.....	I	18	11	29	Aug. 18	.....	4
Corporal.....	Wm. Woertz.....	B	18	11	29	Aug. 9	.....	1
Private	Jos. Buddinburg	B	10	18	28	Aug. 9	.....	2
Sergeant	W. J. Stoner.....	A	13	15	28	Aug. 25	.....	4
Private	W. R. Kelly.....	F	15	13	28	Aug. 25	.....	1
Private	G. J. Romer	F	15	13	28	Aug. 9	.....	4
Private	J. M. Hanley	G	15	13	28	Aug. 8	.....	3
Private	R. Reed.....	H	15	13	18	Aug. 8	.....	1
Captain.....	H. A. Menker (I. R. P.)	Staff.	16	12	28	Aug. 25	.....	10
First Sergt ...	T. B. Sheldon	F	16	12	28	Aug. 25	.....	1
Private	E. Walby	I	16	12	28	Aug. 25	.....	2
Corporal.....	H. M. Scott.....	A	17	11	28	Aug. 8	.....	2
Private	E. E. Gyles, Jr	F	17	11	28	Aug. 25	.....	1
Sergeant	Ed. Cutler.....	I	18	10	28	Aug. 18	.....	2
Corporal.....	W. L. Cooley	A	18	10	28	Aug. 18	.....	....
Private	J. T. Inglesby.....	F	18	10	28	Aug. 25	.....	1
Sergeant	G. A. Milson	B	11	16	27	Aug. 25	.....	2

SIXTY-FIFTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			300 yards.	500 yards.	Total.			
Private	H. Bromley	F	11	16	27	Aug. 8		
Private	J. S. Doorty	B	12	15	27	Aug. 25		1
Private	G. Stentz	B	12	15	27	Aug. 25		1
Corporal	W. E. Parker	B	13	14	27	Aug. 18		2
Private	E. Bauer	D	13	14	27	Aug. 25		
Corporal	F. Nagel	B	14	13	27	Aug. 9		2
Corporal	T. W. Wilson	C	14	13	27	Aug. 9		
Private	O. Haffa	D	14	13	27	Aug. 9		
Private	W. B. Reed	F	14	13	27	Aug. 25		1
Private	F. Stutzman	F	14	13	27	Aug. 25		
Private	F. J. Philcox	G	14	13	27	Aug. 18		
Second Lieut.	J. B. Rawson	G	15	12	27	Aug. 8		
Sergeant	H. Raymond (Col. B.)	N.C.S	15	12	27	Aug. 8		2
Sergeant	W. H. Carter	A	15	12	27	Aug. 8		1
Sergeant	L. H. Gethoefer	F	15	12	27	Aug. 25		5
Corporal	J. C. Flint	F	15	12	27	Sept. 24	C. M. C.	4
Private	H. C. Christie	B	15	12	27	Aug. 9		
Private	A. P. Hazelburger	B	15	12	27	Aug. 18		1
Private	Fred. Obentheere	B	15	12	27	Aug. 25		1
Corporal	J. J. Barrelle	G	16	11	27	Aug. 18		1
Private	Pat. Conway	A	16	11	27	Sept. 17	C. M. C.	2
Private	F. X. Ulrich	A	16	11	27	Aug. 18		1
Private	G. A. Joslyn	B	16	11	27	Aug. 9		1
Private	L. M. P. Lang	B	16	11	27	Aug. 25		2
Private	E. A. Taylor	B	16	11	27	Aug. 25		1
Private	Chas. Fenie	G	16	11	27	Aug. 8		2
Sergeant	G. H. Urban	C	17	10	27	Aug. 18		1
Private	A. T. Conklin	C	17	10	27	Aug. 18		
Private	Chas. Measel	F	17	10	27	Aug. 18		1
Private	Wm. Taggart	I	17	10	27	Aug. 9		
First Lieut.	O. G. Nichols (Com.)	Staff	18	9	27	Sept. 24	C. M. C.	6
Private	Chas. Schell	B	18	9	27	Aug. 9		
Private	Jas. Sharpe	I	18	9	27	Aug. 18		
Private	H. Harney	H	19	8	27	Aug. 18		1
First Lieut.	P. Fogarty	H	20	7	27	Aug. 8		5
Sergeant	John Whittigschlagter	B	12	14	26	Aug. 9		2
Private	F. P. Eckert	B	12	14	26	Aug. 25		2
Corporal	A. A. Brandal	B	13	13	26	Aug. 25		2
Private	C. C. Deuschle	B	13	13	26	Aug. 25		1
Private	Max Moeller	B	13	13	26	Aug. 25		
Private	L. H. Eller	F	13	13	26	Aug. 18		1
Private	C. H. Gibson	G	13	13	26	Aug. 8		3
Corporal	E. Sundberg	D	14	12	26	Aug. 9		1
Corporal	G. W. Nelson	H	14	12	26	Aug. 18		2
Private	A. McLaughlin	H	14	12	26	Aug. 18		1
Private	A. Sharbono	I	14	12	26	Aug. 25		2
Sergt. Major	C. W. Mackenzie	N.C.S	15	11	26	Aug. 25		2
Private	D. G. McConnell	A	15	11	26	Aug. 25		2
Private	A. Peterson	D	15	11	26	Aug. 9		1
Private	J. A. Walter	G	15	11	26	Aug. 8		1
Corporal	Chas. Fink	D	16	10	26	Aug. 18		1
Private	Louis Fonda	A	16	10	26	Aug. 25		2
Private	W. H. Jarley	B	16	10	26	Aug. 9		1
Private	F. A. Nussbaum	B	16	10	26	Aug. 9		1
Private	J. Reed	C	16	10	26	Aug. 9		
Private	A. B. Christey	F	16	10	26	Aug. 8		1
Private	W. H. Rhodes	F	16	10	26	Aug. 25		
Private	C. J. Hager	H	16	10	26	Aug. 8		1
Private	A. Jones	H	16	10	26	Aug. 25		2
Private	Jas. Williams	H	16	10	26	Aug. 25		1
Corporal	Jos. Zimmerman	D	17	9	26	Aug. 25		1
Private	J. H. Schmidt	H	17	9	26	Aug. 18		1
Private	Geo. Kibler	I	17	9	26	Aug. 25		2
Corporal	H. Stack	C	19	7	26	Aug. 9		1
Private	Geo. Gertz	H	19	7	26	Aug. 18		
Private	R. Hartwig	I	19	7	26	Aug. 18		2
Private	J. W. Wistrom	D	20	6	26	Sept. 17	C. M. C.	1
Private	J. J. Ackerman	D	8	17	25	Aug. 18		2
Sergeant	F. C. Hulbert	H	12	13	21	Aug. 8		
Private	Chas. Kohler	A	12	13	25	Aug. 25		2

SIXTY-FIFTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Sergeant	F. G. Bergguist	D	13	12	25	Aug. 9		8
Private	J. W. S. Bergman	B	13	12	25	Aug. 25		
Private	G. Haig	B	13	12	25	Aug. 25		2
Private	W. Gravions	D	13	12	25	Aug. 9		1
Corporal	Eli Ritter	F	14	11	25	Aug. 18		2
Corporal	F. V. Junken	G	14	11	25	Aug. 18		1
Private	Edward Pundt	C	14	11	25	Aug. 9		2
Private	H. Brown	F	14	11	25	Aug. 18		1
Private	C. W. Spadi	G	14	11	25	Aug. 8		
First Lieut.	C. E. P. Babcock	F	15	10	25	Aug. 18		4
Sergeant	C. S. Coffield	D	15	10	25	Aug. 25		1
Private	M. Sweizer	C	15	10	25	Aug. 25		1
Private	R. Inderbitzen	D	15	10	25	Aug. 9		1
Private	F. Sanders	D	15	10	25	Aug. 9		1
Private	W. W. Offeiser	F	15	10	25	Aug. 18		
Private	T. F. Smith	G	15	10	25	Aug. 8		
Sergeant	A. Osbrink	D	16	9	25	Aug. 25		1
Private	John Chappell	A	16	9	25	Aug. 25		
Private	G. D. Critenden	A	16	9	25	Aug. 25		1
Private	J. B. Gorman	D	17	8	25	Aug. 9		1

Total 158

SEVENTY-FOURTH REGIMENT.

(Figure of merit ..... 53.70.)

RANK.	Name.	Company.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Corporal	J. M. Garratt*	D	22	24	46	Aug. 24	C. M. C.	4
Captain	Wm. Franklin (I. R. P.)*	Staff	20	24	44	Aug. 12		6
Colonel	W. M. Bloomer*	Field	22	22	44	Aug. 12		11
First Sergt.	E. L. Gager*	B	21	22	43	Sept. 3	C. M. C.	6
Private	G. A. Rogers*	D	22	21	43	Aug. 12		2
Captain	W. F. Dent	A	20	22	42	Aug. 12		4
Sergeant	F. W. Jungling	E	20	17	37	Aug. 12		1
Corporal	E. A. Lockwood	F	22	15	37	Aug. 17	Fourth Brig.	4
Corporal	J. P. Diehl, Jr.	B	18	18	36	Aug. 26		5
Private	J. W. Beach	F	16	19	35	Aug. 12		
Corporal	Chas. Bogart	B	17	18	35	Aug. 17	Fourth Brig.	4
Captain	G. W. York (Asst. Surg.)	Staff	19	16	35	Aug. 12		4
Second Lieut.	H. L. Fish, Jr.	D	19	16	35	Aug. 19		1
Second Lieut.	W. A. Angus	E	20	15	35	Aug. 12		1
Lieut.-Col.	U. S. Johnson	Field	17	17	34	Aug. 19		6
Captain	C. L. Abell	C	17	17	34	Aug. 19		3
First Lieut.	J. F. Clark	E	18	16	34	Aug. 12		1
Corporal	C. J. Newman	B	15	18	33	Aug. 26		4
Captain	Peter Faulis	G	16	17	33	Sept. 29		7
Private	W. A. McDougal	F	17	16	33	Aug. 12		1
Private	G. M. Arnold	G	18	15	33	Aug. 19		
First Lieut.	B. L. Love	D	19	14	33	Aug. 9		1
Corporal	T. A. Russell	F	19	14	33	Aug. 26		3
Private	E. F. Hickman	F	19	14	33	Aug. 12		
Private	M. J. Leonard	F	15	17	32	Aug. 26		2
Private	H. C. Bostwick	E	16	16	32	Aug. 26		1
Private	G. J. Guck	G	16	16	32	Aug. 11		
Sergeant	W. A. Flett	B	20	12	32	Aug. 26		4
Corporal	C. H. Baker	B	20	12	32	Aug. 17	Fourth Brig.	2
Private	M. S. Ackerman	F	16	15	31	Sept. 29		3

SEVENTY-FOURTH REGIMENT — *(Continued).*

RANK.	Name.	Company.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
			200 yards.	500 yards.	Total.			
Sergeant	C. H. Govrow (Col. B.)	N.C.S	17	14	31	Aug. 11		2
Private	H. C. Moran	A	17	14	31	Aug. 26		1
Private	E. A. Francis	F	17	14	31	Aug. 17	Fourth Brig.	
First Lieut.	H. C. Balcom	B	19	12	31	Aug. 26		5
Sergeant	A. Sauer	E	19	12	31	Aug. 12		
First Lieut	H. R. Clark (Q. M.)	Staff	20	11	31	Aug. 19		5
Private	L. A. Hoffer	F	16	14	30	Sept. 29		2
Captain	F. T. Bloomer	B	17	13	30	Aug. 12		8
Sergeant	Sam. Brown	G	17	13	30	Aug. 26		3
Private	F. W. Chester	A	17	13	30	Aug. 26		3
Private	W. C. Buecke	G	17	13	30	Aug. 19		2
Sergeant	F. G. Alderman	D	11	18	29	Aug 11		3
Major	G. A. Davis	Field	14	15	29	Aug. 26		1
Captain	G. C. Fox	F	14	15	29	Aug. 19		6
Private	Thos. Walsh	D	15	14	29	Aug. 19		2
Q. M. Sergt.	F. R. Hickman	F	16	13	29	Aug. 12		3
Sergeant	W. J. Gordon	A	16	13	29	Aug. 26		1
Private	J. T. Robson	E	16	13	29	Aug. 26		
Sergeant	C. H. Flower	B	17	12	29	Aug. 26		5
Sergeant	H. Hickman	F	17	12	29	Aug. 26		4
Private	S. A. Gaffney	E	18	11	29	Aug. 12		1
Corporal	C. F. Orris	A	19	10	29	Aug. 12		4
Private	Thos. Baldwin	A	19	10	29	Aug. 12		
Private	I. B. Clark	F	12	16	28	Aug. 17	Fourth Brig.	2
First Sergt	F. C. Young	F	13	15	28	Sept. 29		4
Sergeant	G. A. Chase	F	13	15	28	Aug. 26		2
First Lieut.	W. J. Sloan	C	14	14	28	Aug. 19		4
Sergeant	C. A. Clark	N.C.S	16	12	28	Aug. 19		
Corporal	E. Bush	G	16	12	28	Aug. 11		
Private	G. H. Mason, Jr.	E	16	12	28	Aug. 12		
Private	R. A. Greenfield	F	16	12	28	Aug. 26		1
Sergeant	J. R. Kimball	D	17	11	28	Aug. 11		4
Private	F. G. Perrigo	A	17	11	28	Aug. 12		
Private	E. A. Taylor	F	17	11	28	Aug. 12		2
Captain	W. North (Chap.)	Staff.	18	10	28	Aug. 19		4
Sergeant	A. Turner (Col. B.)	N.C.S	18	10	28	Aug. 19		1
Private	S. D. Jerome	B	18	10	28	Sept. 10	C. M. C.	2
Sergeant	F. A. White	C	19	9	28	Aug. 11		5
Corporal	G. P. McArthur	B	19	9	38	Aug. 26		1
Private	C. A. Crigin	C	10	17	27	Sept. 14	C. M. C.	1
Private	P. A. Walters	C	12	15	27	Aug. 11		1
Private	J. W. Mather	C	13	14	27	Aug. 11		3
Private	Wm. Specht	G	13	14	27	Aug. 19		4
Private	E. J. Keller	B	14	13	27	Aug. 12		
Corporal	C. T. Roberts	A	15	12	27	Aug. 26		
Private	Jas. Mack	A	15	12	27	Aug. 12		1
Private	G. R. McLean	B	15	12	27	Aug. 26		4
Private	C. H. Nagel	F	15	12	27	Aug. 12		1
Com. Sergt.	A. Brown	N.C.S	16	11	27	Aug. 26		
Second Lieut.	C. F. E. Menge	G	17	10	27	Aug. 11		6
Private	M. Fillinger	A	17	10	27	Aug. 19		
Private	C. W. Hawkins	B	17	10	27	Aug. 12		1
Private	J. H. Northern	B	17	10	27	Aug. 26		1
Corporal	T. C. Cleary	E	18	9	27	Aug. 26		1
Private	C. O. Backman	A	18	9	27	Aug. 12		1
Private	C. A. Smith	F	20	7	27	Aug. 26		1
Private	F. H. Balcom	B	11	15	26	Aug. 26		1
Private	C. H. Stanch	C	11	15	26	Aug. 19		
Private	H. Post	E	12	14	26	Aug. 19		
Second Lieut.	S. C. Newton	B	13	13	26	Aug. 26		
Private	R. B. McGowan	F	13	13	26	Aug. 12		
First Lieut	C. E. Oberst	G	14	12	26	Aug. 11		4
Private	J. B. Nash	B	14	12	26	Aug. 26		
Private	P. C. Demming	F	14	12	28	Aug. 19		
Private	H. J. Shackleton	F	14	12	26	Sept. 29		
First Lieut	W. E. Otto	F	15	11	26	Aug. 12		3
Private	D. W. Warren	A	15	11	26	Aug. 26		1
Private	W. S. Lull	B	15	11	26	Aug. 26		3
Private	Sam Provoost	B	15	11	26	Aug. 26		
Private	C. H. Fuessler	D	15	11	26	Aug. 11		3

SEVENTY-FOURTH REGIMENT — *(Concluded).*

RANK.	Name.	Company.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	F. D. Macnoe	E	15	11	26	Aug. 26		1
Private	H. J. Hoffer	F	15	11	26	Sept. 29		
First Lieut.	J. C. White (Adj.)	Staff	16	10	26	Aug. 13	C. M. C.	4
Second Lieut.	E. C. Cottle	F	16	10	26	Aug. 19		
Corporal	P. H. Weidman	C	17	9	26	Aug. 19		
Corporal	I. A. Gradzinsky	G	17	9	26	Aug. 11		2
Private	W. J. Hastings	A	17	9	26	Aug. 12		
Private	J. T. Telfair	A	17	9	26	Aug. 12		
Private	E. C. Naal	B	17	9	26	Aug. 12		
Private	E. S. Jehli	B	12	13	25	Sept. 29		
Private	A. C. Bidwell	C	12	13	25	Aug. 19		1
Corporal	C. H. Spaulding	B	13	12	25	Aug. 12		5
Private	A. J. Herold	C	13	12	25	Aug. 11		
Private	B. Smith	D	13	12	25	Aug. 11		2
First Lieut.	W. R. Buck (Com.)	Staff	15	10	25	Aug. 12		1
Private	A. W. Shaw	F	15	10	25	Aug. 12		
Captain	F. N. Farrar	E	16	9	25	Aug. 26		1
Private	C. E. Kirtland	D	17	8	25	Aug. 11		2
Private	C. H. Callahan	E	17	8	25	Aug. 26		1
Private	V. M. Stanley	E	17	8	25	Aug. 12		
Private	J. P. Dunnigan	A	18	7	25	Aug. 12		
Private	C. F. Koff	A	18	7	25	Aug. 12		2

Total..... 122

FIRST SEPARATE COMPANY.

(Figure of merit..... 59.34.)

RANK.	Name.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Second Lieut.	A. C. Harwick *	19	23	42	June 24		9
Private	H. I. Misner *	20	22	42	Sept. 21		
Private	C. E. Wright *	20	22	42	Sept. 21		
Corporal	G. A. Tetterberg	20	20	40	Sept. 22		2
Private	P. H. Flynn	19	16	35	June 23		4
First Lieut.	G. T. Wilkins	18	16	34	June 23		8
Private	E. Meeks	14	19	33	Sept. 22		2
Sergeant	W. W. Clark	16	15	31	June 23		4
First Lieut.	B. L. Holt (Surg.)	18	12	30	June 24		2
Private	J. Levy	15	14	29	June 24		1
Private	A. J. Hodges	16	13	29	June 23		
Private	W. H. Hopkins	18	11	29	June 24		2
Private	G. F. Mapes	14	14	28	Sept. 22		3
Private	G. W. Lewis	18	10	28	June 24		
Private	W. G. Carroll	19	9	28	June 23		1
Captain	A. Gridley	16	11	27	June 23		5
Private	G. E. Almy	16	11	27	June 23		
Private	J. H. Butler	16	11	27	June 23		
Private	E. A. Dunning	17	10	27	June 24		
Private	John Barrett	19	8	27	June 23		4
Private	C. J. Ketchum	16	10	26	June 23		2
Private	A. W. Hathaway	17	9	26	Sept. 22		1
Private	E. H. Nelson	10	15	25	June 22		2
Private	F. R. Gillette	15	10	25	June 24		1

Total..... 24.

SECOND SEPARATE COMPANY.

(Figure of merit..... 81.50.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Captain	W. M. Kirby	20	20	40	Sept. 27		9
Private	H. S. Sawyer	19	20	39	Sept. 27		5
Private	F. H. Putnam	18	19	37	Sept. 27		6
Corporal	F. G. Jones	17	18	35	Sept. 27		5
Sergeant	G. W. Nellis	18	17	35	Sept. 27		6
Corporal	H. F. Horton	18	17	35	Sept. 27		4
Private	F. P. Chesebro	18	15	33	Oct. 7		5
First Sergt	F. J. Stubb	20	13	33	Sept. 27		5
Private	C. O. Smith	21	12	33	Oct. 7		4
Private	S. H. Westover	16	16	32	Sept. 27		10
Private	L. Miller	18	14	32	Sept. 27		3
Private	F. H. Wiggins	17	14	31	Oct. 7		5
Private	T. S. Hall	19	12	31	Sept. 27		1
Private	B. F. Webster	17	13	30	Sept. 27		5
Private	J. C. Bowen	18	12	30	Sept. 27		3
Private	A. J. Young	18	12	30	Oct. 7		1
First Lieut	John Gerin (Asst. Surg.)	13	16	29	Sept. 27		6
Private	J. L. Hickok	15	14	26	Sept. 27		....
Private	H. E. Hills	16	13	29	Oct. 14		5
Private	H. R. Osborn	17	12	29	Sept. 27		2
Private	C. B. Kosters	14	14	28	Oct. 7		5
Private	H. C. Tripp	14	14	28	Oct. 7		3
Private	F. H. Griswold	15	13	28	Oct. 7		9
Private	W. B. Thayer	15	13	28	Sept. 27		3
Private	J. J. Trowbridge	15	13	28	Oct. 7		5
Private	C. E. Doan	16	12	28	Sept. 27		....
Private	H. D. Ramsay	16	12	28	Sept. 27		2
Private	D. P. Hardy	17	11	28	Oct. 7		4
Private	C. H. C. Carney	18	10	28	Sept. 27		2
Corporal	I. W. Haight	19	9	28	Oct. 14		5
Private	F. E. Cady	19	9	28	Oct. 7		6
Private	I. H. Rublee	20	8	28	Sept. 27		1
Private	E. R. Fitch	21	7	28	Oct. 7		6
Private	F. S. Coburn	13	14	27	Oct. 14		4
Private	W. H. Crane	14	13	27	Sept. 27		4
Private	L. F. Carlisle	14	13	27	Sept. 27		1
Private	F. C. Biggs	15	12	27	Oct. 7		5
Private	F. M. Webster	15	12	27	Sept. 27		1
Private	F. B. Hughson	16	11	27	Oct. 7		1
Private	W. A. Martin	16	11	27	Oct. 14		5
Private	J. A. Washburn	16	11	27	Oct. 7		3
Sergeant	C. J. Barber	19	8	27	Sept. 27		7
Sergeant	H. R. Kidney	19	8	27	Sept. 27		4
Private	W. F. Howard	19	8	27	Sept. 27		4
First Lieut	H. S. Dunning	10	16	26	Sept. 27		6
Private	E. G. Dratt	11	15	26	Sept. 27		1
Private	W. G. Colwell	12	14	26	Sept. 27		8
Private	F. W. Miller	12	14	26	Oct. 7		2
Private	F. H. Nickason	13	13	26	Oct. 7		....
Private	G. W. Semple	13	13	26	Oct. 7		....
Private	S. B. Spiller	14	12	26	Oct. 14		1
Private	J. J. White	14	12	26	Oct. 7		1
Private	J. T. Carson	15	11	26	Oct. 7		4
Private	F. S. Cole	15	11	26	Oct. 7		5
Private	B. Irish	15	11	26	Oct. 7		1
Private	J. E. Quick	15	11	26	Sept. 27		1
Private	E. N. Ross	15	11	26	Sept. 27		1
Private	W. B. Barnes	16	10	26	Sept. 27		3
Private	F. M. Whaley	16	10	26	Sept. 27		3
Private	E. Van Alstine	19	7	26	Oct. 7		1
Private	C. A. Tournier	12	13	25	Oct. 7		1
Private	M. J. Bulkley	13	12	25	Sept. 27		2
Private	M. G. Culver	13	12	25	Oct. 7		4
Private	C. H. Payne	13	12	25	Sept. 27		....
Private	C. O. Boyce	14	11	25	Sept. 27		1
Private	H. Cadzow	14	11	25	Oct. 7		1
Private	W. C. Firth	15	10	25	Oct. 7		2

SECOND SEPARATE COMPANY — *(Concluded).*

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	J. F. Davis	16	9	25	Oct. 7		4
Private	W. H. Holmes	16	9	25	Sept. 27		1
Private	H. T. McNaughton	16	9	25	Sept. 27		1
Private	C. W. Hollingshead	18	7	25	Oct. 7		1

Total ..... 71.

EIGHTH SEPARATE COMPANY.

(Figure of merit..... 16.61).

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
First Lieut	F. J. Hess	17	17	34	Oct. 3		1
Private	W. A. Masey	14	18	32	Oct. 3		
Private	George Taylor	16	13	29	Oct. 3		4
Private	L. B. Tharsher	17	12	29	Oct. 3		2
Second Lieut.	F. W. G. Bailey	14	14	28	Oct. 3		5
Private	B. W. Marvin	16	11	27	Oct. 3		
Private	G. D. Seel	16	11	27	Oct. 3		2
Private	J. H. Perkins	14	12	26	Oct. 3		2
Private	W. J. Millington	15	11	26	Oct. 3		1
Private	J. J. Seif	15	11	26	Oct. 3		
Private	A. F. Curry	16	9	25	Oct. 3		
Private	G. F. Albrecht	17	8	25	Oct. 3		1
Private	E. W. Miller	21	4	25	Oct. 3		7

Total ..... 13.

THIRTEENTH SEPARATE COMPANY.

(No practice).

TWENTY-FIFTH SEPARATE COMPANY.

(No practice).

TWENTY-SIXTH SEPARATE COMPANY.

(Figure of merit..... 72.60.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Captain	E. Root*	21	21	42	Sept. 23		8
Corporal	E. E. Lyon	20	18	38	Sept. 24		3
First Lieut	F. B. Parke (Asst. Surg.)	16	21	37	Sept. 23		
Private	G. L. Markham	16	21	37	Sept. 23		
Private	C. J. Burt	17	20	37	Sept. 23		1
Private	H. M. Sheive	18	17	35	Sept. 24		
Private	L. Mowery	15	19	34	Sept. 24		
Private	F. M. Graves	12	21	33	Sept. 24		1
First Sergt	M. O. Tyrell	16	17	33	Sept. 23		4
Corporal	F. H. Dalrymple	18	15	33	Sept. 23		1
Private	F. Reeves	17	15	32	Sept. 23		
Private	E. C. Bunnell	15	16	31	Sept. 23		
Private	F. Van Gorder	15	16	31	Sept. 24		
Sergeant	F. J. Jones	12	18	30	Sept. 23		2
Private	Charles Blunt	13	17	30	Sept. 24		
Private	F. Ersley	14	13	30	Sept. 24		
Private	H. E. Hungerford	15	16	31	Sept. 23		1
Corporal	E. Van Buskirk	15	15	30	Sept. 23		5
Private	H. Miller	16	14	30	Sept. 23		
Private	D. Kenney	20	10	30	Sept. 23		
Private	E. Fletcher	21	9	30	Sept. 24		1
Sergeant	S. H. Vandermack	13	16	29	Sept. 23		4
Private	F. Johnson	16	13	29	Sept. 24		
Private	J. W. Rife	16	13	29	Sept. 24		
Sergeant	B. W. Ross	17	12	29	Sept. 23		3
Corporal	G. B. Tifft	13	15	28	Sept. 23		4
Private	W. C. Rice	17	11	28	Sept. 24		
Private	R. Howard	15	12	27	Sept. 23		
Private	S. Quick	15	12	27	Sept. 23		
Private	E. D. Bowen	16	11	27	Sept. 23		1
Private	A. Burbank	16	11	27	Sept. 23		
Private	E. L. Crego	16	11	27	Sept. 23		
Private	F. Hoagland	16	11	27	Sept. 24		
Private	W. Ostrander	16	11	27	Sept. 23		
Q. M. Sergt	A. J. Brown	17	10	27	Sept. 23		7
Corporal	C. M. Ersley	17	10	27	Sept. 23		3
Private	F. Ostrander	17	10	27	Sept. 24		
Private	A. S. Ward	17	10	27	Sept. 24		1
Private	Geo. Hart	20	7	27	Sept. 23		
Private	F. Jones	12	14	26	Sept. 24		2
Private	C. W. Teed	14	12	26	Sept. 24		
Private	R. Congdon	15	11	16	Sept. 23		
Private	L. W. French	15	11	26	Sept. 23		
Private	W. A. Pease	15	11	26	Sept. 24		
Private	E. J. Brown	16	10	26	Sept. 23		3
Private	G. Brown	17	9	26	Sept. 24		1
Private	A. J. Cook	17	9	26	Sept. 23		
Private	Chas. Golden	17	9	26	Sept. 24		
Private	Chas. Stanton	17	9	26	Sept. 24		1
Private	F. Smith	18	8	26	Sept. 24		1
Private	H. F. Goehring	12	13	25	Sept. 33		1
Private	R. B. Van Gorder	12	13	25	Sept. 24		
Private	F. M. Fuller	13	12	25	Sept. 23		1
Private	S. Goodno	13	12	25	Sept. 24		
Private	M. K. Hurley	13	12	25	Sept. 24		1
Private	A. Finch	14	11	25	Sept. 23		
Private	F. Williams	14	11	25	Sept. 24		
Private	F. Burlingame	15	10	25	Sept. 24		1
Private	F. D. Genung	15	10	25	Sept. 23		2
Private	John Senzel	16	9	25	Sept. 23		1
Private	J. H. W. Alger	19	6	25	Sept. 23		

Total..... 61

TWENTY-NINTH SEPARATE COMPANY.

(Figure of merit.....61.57.)

RANK.	Name.	SCORES.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Second Lieut.	P. T. Perkins*	22	21	43	July 21		10
Sergeant	C. R. Hoey	21	17	38	Oct. 4		4
Private	J. E. Slight	16	19	35	Oct. 4		1
Private	Jas. Gallagher	13	19	32	July 21		
Private	Jas. McCully	17	15	32	July 21		2
Private	A. L. Dunsmore	15	16	31	July 21		
Private	C. J. Wiley	17	14	31	July 21		
Private	De L. F. Hall	19	12	31	July 21		
Private	J. Monaghan	19	11	30	July 21		1
Private	J. U. Gorass	15	14	29	July 21		
Q. M. Sergt.	G. H. O'Brien	18	11	29	July 21		2
Private	A. M. Hall	12	16	28	July 21		
Private	W. J. Rassmussen	12	16	28	Oct. 4		
First Sergt.	William Monaghan	14	14	28	July 21		2
Private	G. G. Vickerry	16	11	27	Oct. 4		
Private	F. R. Wiley	10	15	25	July 21		
Private	C. A. Coleman	12	13	25	July 21		
Private	J. F. Schilling	14	11	25	Oct. 4		
Corporal	W. E. Post	16	9	25	July 21		2
Private	H. F. Sweet	16	9	25	Oct. 4		
Corporal	F. Wills	18	7	25	Oct. 4		1

Total..... 21

THIRTIETH SEPARATE COMPANY.

(Figure of merit.....71.68.)

RANK.	Name.	SCORES.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	F. F. Aldridge*	20	24	44	Aug. 17	4th Brigade.	3
Corporal	T. A. Brown	19	20	39	Aug. 17	4th Brigade.	2
Sergeant	J. M. Elston	18	19	37	Aug. 17	4th Brigade.	9
Private	C. H. Knipp	20	17	37	Aug. 17	4th Brigade.	5
First Sergt.	H. N. Hoffman	18	18	36	June 22		4
First Lieut.	E. M. Hoffman	20	15	35	Oct. 5		9
Private	W. A. Ballard	19	15	34	Nov. 3		
Second Lieut.	J. T. Sadler	19	14	33	Oct. 6		7
Corporal	F. E. Smith	21	12	33	Oct. 5		4
Private	B. C. White	17	15	32	June 22		3
Private	H. L. Fassett	14	17	31	Nov. 3		1
Private	F. R. Knapp	14	17	31	Oct. 5		2
Q. M. Sergt.	R. Ker	16	15	31	Nov. 3		4
Private	W. E. Terry	16	15	31	Oct. 5		3
Private	J. F. Lingle	17	14	31	Oct. 5		2
Private	J. T. Berry	15	15	30	Oct. 6		2
Private	F. C. Carpenter	15	16	30	Oct. 5		1
Captain	R. Morse	16	14	30	Oct. 5		8
Corporal	F. W. Kies	16	14	30	Oct. 6		5
Private	E. H. P. Smith	17	13	30	Oct. 5		
Private	F. B. Weaver	17	13	30	Oct. 6		
Private	G. C. Miller	18	12	30	Oct. 5		
Private	B. McDowell	11	18	29	Oct. 5		3
Private	W. C. Publes	11	18	29	Oct. 5		3
Sergeant	J. H. Pierce	15	14	29	Oct. 5		6

THIRTIETH SEPARATE COMPANY — *(Concluded).*

RANK.	Name.	SCORES.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	L. H. Merchant	12	16	28	June 22		2
Private	C. W. Stuart	14	14	28	Oct. 6		
Private	J. E. Varnum	16	12	28	Oct. 6		1
Private	C. E. Campbell	18	10	28	Nov. 3		2
Private	H. A. V. Wadhams	20	8	28	Oct. 5		
Private	W. J. Lormore, Jr.	12	15	27	Oct. 6		
Private	W. R. Ten Broecke	13	14	27	Oct. 5		3
Private	G. A. Grenville	14	13	27	Oct. 5		
Private	P. E. Meyer	14	13	27	June 22		2
Private	J. E. Beers	15	12	27	June 22		4
Private	E. K. Tidd	15	12	27	Nov. 3		
Private	W. B. Herron	18	9	27	Nov. 3		
Private	W. B. Pattinson	18	9	27	June 22		3
Private	H. M. Beardsley	11	15	26	Nov. 3		
Private	F. M. Jones	13	13	26	Oct. 6		2
Private	W. H. Lee	15	11	26	Nov. 3		1
Private	H. G. Kimball	16	10	26	Oct. 5		
Private	F. B. Sadler	11	14	25	Oct. 5		4
Private	C. A. Phillips	12	13	25	June 22		1
Private	N. A. Wolcott	14	11	25	Nov. 3		2
Private	L. A. Merrill	16	9	25	Oct. 6		
Private	O. C. Bidwell	17	8	25	Oct. 5		
Private	Jos. Edwards	17	8	25	June 22		5

Total ..... 48.

THIRTY-FOURTH SEPARATE COMPANY.

(Figure of merit ..... 68.78.)

RANK.	Name.	SCORES.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	H. B. Tuttle	21	17	38	June 16		1
Corporal	D. R. Hawkins	18	16	34	June 16		3
Sergeant	G. E. Gasper	19	15	34	June 16		4
Captain	Wm. Wilson	19	14	33	June 16		5
Private	E. Moan	16	16	32	June 16		
Private	J. W. Millen	17	15	32	June 19		1
Private	F. L. Combs	14	17	31	June 16		2
Private	G. F. Ditmar	14	17	31	June 16		
Corporal	R. J. Wyatt	17	14	31	Oct. 26		2
Corporal	R. Murrin	13	17	30	June 16		1
Private	E. E. Merry	14	16	30	June 16		2
Private	E. W. Jewett	18	12	30	June 16		
Corporal	F. L. Bedell	16	13	29	June 16		3
Private	C. J. Combs	17	12	29	Oct. 26		1
Private	J. H. Haslett	14	14	28	June 16		
Private	H. B. Graves	16	12	28	June 16		
Private	E. G. Strong	10	17	27	June 16		
Private	D. L. Ferris	11	16	27	June 16		
Corporal	F. E. Fairfax	12	15	25	June 16		1
Private	J. R. Blind	17	10	27	June 16		1
Private	C. W. Parker	18	9	27	June 16		2
Private	J. P. Kelley	21	6	27	Oct. 26		
Private	E. Z. Trimmer	11	15	26	June 16		1
Private	W. H. Tulette	11	15	26	June 16		2
Private	H. Van Deren	11	15	26	June 16		2
Private	Jas. Catchpole	14	12	26	June 16		2

THIRTY-FOURTH SEPARATE COMPANY — *(Concluded).*

RANK.	Name.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	E. C. Nichols	14	12	26	Oct. 26		1
Private	H. W. Schermore	14	12	26	June 16		
Private	W. M. Toomer	14	12	26	June 16		
Corporal	S. F. Gascoigne	15	11	26	Oct. 26		2
Private	G. B. Underhill	16	10	26	Oct. 26		1
Sergeant	C. H. Kepple	17	9	26	June 16		5
Private	W. J. McMaster	11	14	25	June 16		1
Private	H. J. Beers	12	13	25	June 16		
Private	F. A. Rogers	13	12	25	June 16		
Private	C. F. Snell	15	10	25	Oct. 26		
Private	W. F. Mehan	16	9	25	June 16		2

Total..... 37.

THIRTY-EIGHTH SEPARATE COMPANY.

(Figure of merit..... 55.38.)

RANK.	Name.	Scores. 200 yards.	Scores. 500 yards.	Scores. Total.	Date of qualification.	If in match, state what.	Previous qualifications.
Private	W. H. Pierce	18	17	35	Sept. 27		
Second Lieut.	A. L. Bilque	16	17	33	Sept. 27		5
Captain	F. J. Stearns	17	14	31	Sept. 27		6
Private	E. J. Davis	18	13	31	Sept. 27		
Private	H. G. Seeber	13	16	29	Sept. 27		
Private	L. Hames	15	14	29	Sept. 27		
Private	W. S. Ratigan	17	12	29	Sept. 27		1
Private	G. W. Merriam	18	11	29	Sept. 27		
Private	W. R. Shayes	14	14	28	Sept. 27		
First Lieut.	DeS. H. Tifft	16	12	28	Sept. 27		
Private	N. E. Boes	16	12	28	Sept. 27		
Private	C. F. Stebbins	16	12	28	Sept. 27		
Private	F. Schubothe	17	11	28	Sept. 27		
Private	F. W. Gillespie	13	14	27	Sept. 27		2
Private	G. F. Kinsett	12	14	26	Sept. 27		
Private	W. G. Parker	13	13	26	Sept. 27		
Private	F. McKinstry	14	12	26	Sept. 27		
Sergeant	Edw. Woodruff	15	11	26	Sept. 27		1
Private	C. W. Simmons	15	11	26	Sept. 27		
Private	Jas. Wallace	16	10	26	Sept. 27		
Private	C. F. Pickret	17	9	26	Sept. 27		
Corporal	T. H. King	14	11	25	Sept. 27		1
Private	E. Claus	17	8	25	Sept. 26		

Total..... 23.

FORTIETH SEPARATE COMPANY.

(No practice.)

FORTY-FIRST SEPARATE COMPANY.

(No practice.)

FORTY-SECOND SEPARATE COMPANY.

(Figure of merit..... 69.38.)

RANK.	Name.	Scores.			Date of qualification.	If in match, state what.	Previous qualifications.
		200 yards.	500 yards.	Total.			
Private	J. Brewster	18	25	43	Aug. 17	4th Brigade.	1
Private	C. L. Pratt	22	21	43	Aug. 31	C. M. C.	1
First Lieut	L. W. Pettibone	18	20	38	Sept. 29	C. M. C.	1
Private	W. Young	18	20	38	Sept. 24	C. M. C.	1
Private	R. Barr	19	19	38	Aug. 17	4th Brigade.	1
Private	G. H. Salt	17	19	36	Aug. 26		
Private	R. Sinclair	22	14	36	Sept. 22	C. M. C.	
Private	D. Rieckoff	21	14	35	Aug. 31	C. M. C.	1
Private	N. L. Benham	19	15	34	Sept. 17	C. M. C.	
Private	O. Phillips	13	20	33	Aug. 27		
Private	H. Campbell	16	17	33	Sept. 12	C. M. C.	1
Private	J. J. Haniahan	13	19	32	Nov. 3	C. M. C.	1
First Sergt	C. E. Cromley	14	18	32	Sept. 22	C. M. C.	1
Private	F. J. Brown	20	12	32	Aug. 26		
Private	G. C. Whitman	15	16	31	Aug. 26		
Q. M. Sergt	R. A. Schufer	20	11	31	Aug. 26		1
Sergeant	S. J. Mason	20	11	31	Aug. 24		1
Private	J. H. Finnell	16	14	30	Aug. 24		
Private	N. H. Kimball	19	11	30	Aug. 30	C. M. C.	
Sergeant	J. M. Hancock	13	16	29	Aug. 25		
Sergeant	F. C. Deveaux	15	14	29	Aug. 26		1
Private	G. E. Pool	17	12	29	Aug. 26		
Private	W. H. Woodbury	17	12	29	Aug. 24		
Private	F. E. Lawson	18	11	29	Aug. 25		1
Private	C. M. Young	18	11	29	Sept. 19	C. M. C.	1
Private	D. Whitney	13	15	28	Aug. 27		1
Private	C. B. Hyde	14	14	28	Aug. 26		
Private	C. Mackenna	16	12	28	Aug. 26		
Private	S. M. Brooks	19	9	28	Sept. 24	C. M. C.	
Private	J. W. Crick	20	8	28	Sept. 16	C. M. C.	
Private	F. A. Locher	20	8	28	Aug. 26		1
Private	G. F. Nye	12	15	27	Aug. 25		1
Corporal	C. H. Piper, Jr	13	14	27	Sept. 26	C. M. C.	1
Private	T. S. Skinner	14	13	27	Aug. 26		
Private	W. F. Gassler	15	12	27	Sept. 26	C. M. C.	
Private	L. A. Boore	16	11	27	Aug. 17	4th Brigade.	
Private	H. M. Fales	16	11	27	Aug. 27		
Private	C. P. Graves	16	11	27	Aug. 25		
Private	M. Harrington	18	9	27	Aug. 24		
Corporal	George Baker	20	7	27	Aug. 27		1
Private	B. B. Young	15	11	26	Aug. 27		
Private	C. H. Clark	16	10	26	Aug. 27		
Private	E. O. Babcock	17	9	26	Aug. 24		1
Private	Thomas Conroy	17	9	26	Sept. 27	C. M. C.	1
Private	D. Schwartz	18	8	26	Aug. 27		
Private	R. N. Campbell	19	7	26	Sept. 19	C. M. C.	1
Private	C. H. Kugel	13	12	25	Aug. 25		
Corporal	W. Jones	14	11	25	Aug. 25		1
Private	H. A. Keller	14	11	25	Aug. 26		
Private	W. Mingay	14	11	25	Aug. 25		1
Corporal	F. W. Oliver	15	10	25	Aug. 27		1
Private	T. J. Walker	16	9	25	Sept. 24	C. M. C.	
Captain	C. B. Gaskill	17	8	25	Aug. 27		1
Private	L. B. Ackley	17	8	25	Aug. 24		
Private	E. E. Philpott	17	8	25	Aug. 26		1

Total..... 55.

FORTY-THIRD SEPARATE COMPANY.

(No practice.)

EXTRACT FROM GENERAL ORDERS No. 8—SERIES OF 1885—GENERAL HEADQUARTERS, S. N. Y.

"Companies which fail to parade at least fifty per cent. of their strength for class and forty per cent. for volley and skirmish practice, will be published in orders as delinquent."

ORGANIZATION.	Commmanding Officer.	Strength at last inspection.	Number practicing class.	Number practicing volley and skirmish.
Company B, Eighth Regiment	Captain T. M. Young	38	20	9
Company C, Eighth Regiment	Captain A. T. Mason	36	20	9
Company D, Eighth Regiment	First Lieut. H. Howe	76	24	13
Company F, Eighth Regiment		55	9	.....
Company H, Eighth Regiment	First Lieut. M. Van Rensselear, Jr.	49	19	8
Company A, Ninth Regiment	Captain G. T. Lorigan	56	27	19
Company B, Ninth Regiment	Captain N. L. Cochen	48	19	14
Company E, Ninth Regiment	Captain S. E. Japha	47	19	9
Company G, Ninth Regiment	Captain A. Chamberlin	48	22	8
Company I, Ninth Regiment	Captain H. W. Leonard	54	22	11
Company I, Eleventh Regiment	Captain C. F. Surburg	55	24	14
Company K, Eleventh Regiment	Captain George Loeser	49	18	17
Company A, Twelfth Regiment	Captain H. Pell	71	45	23
Company C, Twelfth Regiment	Captain J. A. Haskell	68	35	19
Company D, Twelfth Regiment	Captain B. S. Barnard	97	62	29
Company E, Twelfth Regiment	Captain John Macauley	52	24	12
Company H, Twelfth Regiment	Captain W. Content	77	47	24
Company A, Fourteenth Regiment	Captain J. J. Dixon	46	21	12
Company C, Fourteenth Regiment	Captain B. S. Steen	43	14	.....
Company D, Fourteenth Regiment	First Lieut. A. L. Kline	47	21	9
Company E, Fourteenth Regiment	Captain J. R. K. Barlow	58	12	.....
Company G, Fourteenth Regiment	First Lieut. E.M.Christensen	54	13	.....
Company H, Fourteenth Regiment	Captain John Cutts	47	15	.....
Company A, Twenty-second Regiment,	Captain W. E. Preece	51	25	14
Company I, Twenty-second Regiment,	Captain J. P. Leo	51	23	16
Company K, Twenty-second Regiment,	Captain G. E. B. Hart	45	19	13
Company A, Twenty-third Regiment	Captain E. F. Haviland	82	72	24
Company D, Thirty-second Regiment.	Captain E. Verdeckberg	56	23	19
Company H, Thirty-second Regiment.	Captain W. F. Grotz	60	25	19
Company B, Forty-seventh Regiment	Captain A. A. Doughty	41	19	10
Company G, Forty-seventh Regiment	Captain W. R. Pettigrew	67	48	13
Company A, Sixty-fifth Regiment	Captain G. J. Haffa	44	19	12
Company C, Sixty-fifth Regiment	Captain G. H. Howard	51	14	11
Company G, Sixty-fifth Regiment	Captain R. H. Montgomery	48	16	7
Company A, Sixty-ninth Regiment	Captain M. Brennan	74	41	23
Company D, Sixty-ninth Regiment	Captain M. Cox	91	37	26
Company E, Sixty-ninth Regiment	Captain H. Coleman	101	36	11
Company F, Sixty-ninth Regiment	Captain Thomas Mortimer	94	43	37
Company G, Sixty-ninth Regiment	Captain S. R. Ryan	79	31	17
Company H, Sixty-ninth Regiment	Captain P. J. Morgan	100	34	20
Company I, Sixty-ninth Regiment	Captain J. G. Cunningham	80	27	19
Company A, Seventy-first Regiment	Captain C. M. Kennedy	55	24	8
Company C, Seventy-first Regiment	Captain A. T. Francis	42	28	13
Company D, Seventy-first Regiment	Captain W. C. Clark	89	36	16
Company F, Seventy-first Regiment	Captain J. A. H. Drossel	49	19	8
Company G, Seventy-first Regiment	Captain J. E. Place	48	17	7
Company H, Seventy-first Regiment	Captain A. P. Delcambre	69	34	17
Company I, Seventy-first Regiment	Captain L. F. Barry	73	20	12
Company K, Seventy-first Regiment	Captain W. D. Goss	64	33	20
Company A, Seventy-fourth Regiment,	Captain W. F. Dent	51	17	10
Company B, Seventy-fourth Regiment,	Captain F. T. Bloomer	52	25	10
Company C, Seventy-fourth Regiment,	Captain C. L. Abell	43	17	6
Company D, Seventy-fourth Regiment,	Captain A. J. Dance	42	11	6
Company E, Seventy-fourth Regiment,	Captain F. N. Farrar	47	15	14
Company G, Seventy-fourth Regiment,	Captain Peter Paulis	43	14	13
Company A, Tenth Battalion	Captain A. J. Wing	65	47	18
Company C, Tenth Battalion	Captain J. L. Hyatt	56	28	14
Company D, Tenth Battalion	Captain E. V. Denison	53	27	.....
Eighth Separate Company	Captain H. B. Henderson	59	26	.....
Twelfth Separate Company	Captain Joseph Egolf	98	34	30
Thirteenth Separate Company	First Lieut. A.W. Ljungberg	53	No practice.	

EXTRACT FROM GENERAL ORDERS No. 8 —*(Concluded).*

ORGANIZATION	Commanding Officer.	Strength at last inspection.	Number practicing class.	Number practicing volley and skirmish.
Fifteenth Separate Company	Captain B. Myers	58	27	.....
Twenty-fourth Separate Company	Captain C. B. Wood	63	No practice.	
Twenty-fifth Separate Company	Captain John Raines	31	No practice.	
Twenty-eighth Separate Company	Captain J. H. Remmer	68	No practice.	
Thirty-first Separate Company	Captain A. J. Budlong	62	42	.....
Thirty-eighth Separate Company	Captain F. J. Stearns	66	27	23
Fortieth Separate Company	First Lieut. M. J. Blakely	69	No practice.	
Forty-first Separate Company	Captain W. B. Randall	70	No practice.	
Sixth Battery	Captain L. L. Olmstead	65	43	.....

CHAS. S. ROBBINS,

Brig.-Gen. and Gen. Insp. Rifle Practice, S. N. Y.

(J.)

REPORT OF BRIG.-GEN. LOUIS FITZGERALD ON FIRST BRIGADE AND PROVISIONAL BRIGADE.

HEADQUARTERS FIRST BRIGADE, N. G. S. N. Y.,
No. 6 PINE STREET,
NEW YORK, *November* 30, 1887.

The Adjutant-General State of New York:

SIR.—In accordance with p. 591 M. C., I have the honor to submit the following report of the First Brigade, N. G. S. N. Y.:

MOVEMENT OF TROOPS.

On Memorial Day, the First Brigade, consisting of the Seventh, Eighth, Ninth, Eleventh, Twelfth, Twenty-second, Sixty-ninth and Seventy-first Regiments, and the First and Second Batteries, paraded under my command as participants in the commemoration ceremonies, and as escort to the Grand Army of the Republic.

On the sixteenth of September the Twelfth and Twenty-second Regiments proceeded to Philadelphia, Penn., under my command, to take part in the centennial celebration of the adoption of the Federal Constitution, returning the same day. They formed part of the Provisional Brigade detailed for that duty by S. O. No. 77, General Headquarters.

The following regiments of this brigade were present at the State camp in accordance with G. O. No. 20, General Headquarters: The Seventh, Ninth, Twelfth, Twenty-second and Seventy-first, part of the First Battery and all of the Second Battery.

The Twenty-second Regiment marched from its headquarters in New York to the camp.

On the 22d of April, 1887, the following transfers were made: Eighth Regiment to the armory corner of Thirty-fifth street and Broadway, previously occupied by the Seventy-first Regiment; Twelfth Regiment to the new armory corner of Sixty-second street and Ninth avenue, and the Seventy-first Regiment to the corner of Forty-fifth street and Broadway, previously occupied by the Twelfth Regiment.

STRENGTH OF THE BRIGADE.

The aggregate strength of the brigade by the quarterly return dated September 30, 1886, was 5,384; the strength for the corresponding quarter this year is 5,514, a gain of 130.

BOARD OF EXAMINATION.

The excellent system of examination which has existed for the last year before a competent and careful board of officers, has secured during that period officers fully informed as to the duties of their grade.

ENLISTMENT.

The bad condition and inadequacy of some armories has deterred enlistment, in a measure; but this is a temporary evil which the building of new armories will dispel. Anxiety to enlist should not be so great as to prevent the most searching inquiry into the character and mode of life of the applicant. A bad man in a command is a potent element of evil, a good one is an element of strength. The State funds should only be expended on her best citizens.

INSTRUCTION.

The instruction, theoretical and practical, of the officers of the brigade during the past year, from personal observation, and from the returns received from the several commands of the brigade and forwarded to general headquarters previous to June fifteenth, has been well performed.

A more uniform system, however, is essential, and the instruction of officers should be restricted to such practical matters as are likely to be of use in the State service. The distinction between regular soldiers and citizen soldiers is not invidious to the latter; each have peculiar duties to perform under widely differing circumstances, and it is not at all necessary for the one to be able to perform all the duties of the other. Thus, the citizen soldier will never and can never be called upon to perform long and arduous marches nor to take part in any warfare on such a scale as to require pitched battles, strategic movements or the higher order of tactics; and while such studies are interesting, the time occupied in their pursuit might be better employed in the preparation of the citizen for the simple and more practical duties of the soldier, the company and the battalion.

I recommend that a board of officers be convened either by the Adjutant-General or by the brigade commander, to prepare a course of instruction for officers; in the former case subject to the approval of the Adjutant-General, in the latter to the approval of the brigade commander.

ARTILLERY.

The artillery should be provided with proper armories, and no effort should be spared in placing in their hands the most approved breech-loading and magazine guns. The armories should be built adjoining or as near as practicable to the armories of the infantry, for mutual protection, so that they could be moved together to the scene of any disorder. A support is always necessary to artillery and vital in street fighting. In addition to the mounted drills, which should be as numerous as possible, the batteries should have practice in actual firing. Instead of going into the State camp, they should be put under canvas on the reservation of a United States fort in the harbor, where there is ample space and where the sanitary conditions are good. The contact with officers and men of the regular army would give them an opportunity for acquiring information that they could not obtain under other circumstances. Permission from the federal authorities is always cheerfully given for that purpose.

RIFLE PRACTICE.

Renewed efforts on the part of the officers and men have produced improved results in rifle practice, and although the access to the range is as inconvenient as ever, a large number of the brigade have availed themselves of the opportunity for practice. Some slight friction has arisen in relation to the arrangement of dates for general practice, which might be obviated by the assignment to the brigade of a certain number of dates from which the brigade commander could make the assignments to the several organizations in his command.

INSPECTION.

The inspections of last year and this year have demonstrated the desirability of holding the annual inspections at the close of the drill season in the spring, instead of at the commencement of the season in the autumn. In the former case the troops are well in hand and perform the required evolutions with precision, while in the autumn they show the inevitable effects of a long vacation. It is my earnest desire to instruct my command in the field, and for obvious reasons the autumn is the only time suitable for such exercises, but on account of the preparation for and performance of the ceremony of inspection, it has been impossible to arrange any autumnal manœuvres without too great inconvenience to the commands.

Very respectfully.

LOUIS FITZGERALD,
Brigadier-General.

HEADQUARTERS FIRST BRIGADE NATIONAL GUARD,
EQUITABLE BUILDING NO. 6 PINE STREET,
NEW YORK, *September* 19, 1887

To the Adjutant-General State of New York, Albany, N Y.:

SIR.—I have the honor to report that in pursuance of Special Orders No. 77 General Headquarters. I assumed command of the Provisional Brigade therein designated, comprising the Twelfth, Twenty-second and Twenty-third Regiments and the Second, Eighth, Nineteenth, Twentieth, Twenty-second, Twenty-sixth, Thirtieth, Thirty-second, Thirty-fifth, Thirty-ninth, and Forty-first separate companies, on the morning of Friday, September sixteenth and proceeded to Philadelphia *via* the Pennsylvania Railroad, transportation having been arranged by the Commissary-General of the State.

The troops were embarked with as little delay as possible, considering the large number of men to be accommodated. The last section of the train left Jersey City about half an hour after the time agreed upon, viz.: 8 A. M. The train consisted of five sections of about ten cars each. On reaching Philadelphia it was apparent that considerable delay would occur in getting into the P. W. & B. depot, our destination, owing to a blockade. I ordered the troops at once to disembark, being within about six blocks of the place of rendezvous, with directions where and how to form. A staff officer of the National Guard of Pennsylvania reported to me, as previously requested, on my arrival and furnished such information as I desired.

After the parade, under the command of Lieutenant-General Phil. H. Sheridan, U. S. A., was finished, I ordered the Provisional Regiment and the Twelfth Regiment to Germantown Junction, each under the escort of a staff officer, the same sections which brought them to Philadelphia having been ordered to meet them there at 3 P. M., with their knapsacks and haversacks, all of which were left by my direction in the cars.

They arrived in New York the same evening about 8 o'clock. The Twenty-second and Twenty-third Regiments having accepted the hospitality of the Pennsylvania National Guard proceeded at once to the armory of the First Regiment, National Guard of Pennsylvania. I then relinquished the command. These regiments returned safely during the night to New York. By my sanction they made their own arrangements for the hour of departure from Philadelphia with the P. R. R. Co. The concentration of the separate companies, has not only shown the facility of mobilization of the State troops but also their thorough military instruction acquired through the efforts of the present able administration.

The promptness and efficiency of the commanding officers of the Twelfth, Twenty-second and Twenty-third regiments is worthy of especial mention. The discipline of the men in every command as far as came within my observation left nothing to be desired.

I take pleasure in inviting the attention of the department to the energy and ability displayed by my quartermaster, Major Wendell Goodwin, in all the details of his varied and important duties. I wish also to invite attention to the excellent work done by my aides, Captains W. Emlin Roosevelt and Francis R. Appleton.

The citizens of the State of New York can well be proud of the appearance and soldierly bearing of its National Guard at the Centennial Celebration of the adoption of the Federal Constitution.

Very respectfully, your obedient servant.

LOUIS FITZGERALD,
Brigadier-General Commanding.

(K.)

REPORT OF GEN. J. G. FARNSWORTH

ON THE

CONDITION OF THE WAR CLAIMS OF THE STATE AGAINST THE UNITED STATES, DECEMBER 31, 1887.

ALBANY, *December* 31, 1887.

To the Adjutant-General, State of New York:

SIR.—I have the honor to report that during the past year the work of prosecuting the claims of the State for expenses incurred for raising troops for the United States service during the war of the rebellion has been steadily progressing; that I have obtained further allowances and that there now stands to the credit of the State on the books of the Treasury department $60,638.94, as will appear by reference to the letters of the second comptroller and the third auditor hereunto annexed. This amount will be included by the Secretary of the Treasury in the schedule that he transmits to Congress of funds to be provided for in the appropriation bills of the present session.

These allowances have been made by the accounting officers of the treasury upon vouchers that have previously been examined and rejected because they did not conform to the requirements of the auditing officers, for lack of proper proofs that the expenditures were made in compliance with the act of Congress that provides for their payment when presented in proper form, and for other informalities and irregularities.

The lapse of over twenty years since the expenditures were incurred, the deaths and removals from the States to parts unknown of many persons from whom valuable evidence might have been procured, the imperfect manner in which the records were kept in some departments of the State during the war, the loss or mislaying of vouchers and of papers containing corroborative evidence regarding expenditures, render the work of supplying new proofs, of completing imperfect vouchers and of making explanations to the accounting officers that will secure satisfactory results, difficult to perform and often tedious and perplexing.

Before I was placed in charge of this work, the plan pursued was that of selecting from the claims originally rejected, those that seemed most likely to be admitted and that could most readily be put in condition to meet the requirements of the accounting officers, to whom they were again submitted and on a portion of them allowances were obtained. This process had been carried on until it was reported that nearly all that could be admitted, under existing rules, had been passed upon and allowed; the remainder consisting of the vouchers that were most difficult, and in many cases impossible, to put in such shape as to meet with favorable action.

The work commenced last year, of taking up all the disallowed and suspended vouchers in regular order and in each case putting them in condition so far as possible, is being carried on and as rapidly as they are prepared they are laid before the third auditor and second comptroller for their action and upon them I confidently except further allowances.

The annexed statement of the condition of the claims, giving the original installments and the allowances that have been made, shows a balance of $1,017,936.41 due to the State. Of this amount the interest in Comptroller's bonds issued in 1861, the expenditures for sanitary supplies, for defense of New York harbor, for transporting and paying, etc., troops employed to protect our northern frontier from raids from southern refugees in Canada in 1863–4, for duties paid on arms imported in 1863, for care of the sick and wounded and for the expenses of the agents of the State employed in caring for the wants and providing for the common comforts of our troops in the field, all included in the original installments, have been totally disallowed, and will not be paid to the State without further action of Congress.

Efforts will be made during the present session to obtain such action of Congress as will lead to the modification of the laws and rules governing the accounting officer of the treasury and thus authorizing the admission of a large number of the claims for war expenditures, in many instances acknowledged by the general government to be just and equitable, but rejected for informalities and technical reasons, as not coming under the provisions of the act of Congress approved July 27, 1861.

I have prepared and placed in the hands of Hon. Frank Hiscock and Hon. Charles Tracey bills for refunding the duties paid by the State on arms imported in 1863 and issued to troops raised for the United States service, amounting to $42,796.87; if not already introduced they will be on the first day set apart for introduction of bills, both in the Senate and the House of Representatives.

A bill has also been prepared, and will be introduced at the earliest opportunity, for the payment of certificates issued by the State to the soldiers of 1812.

A bill has been introduced in the United States Senate for refunding to the several States the direct tax levied by the general government in 1861, and it is probable that the efforts that will be made to secure its passage will be successful. During the last Congress a similar bill passed the Senate with but one dissenting vote, and would probably have passed the House of Representatives if it could have been reached before final adjournment. Should this bill become a law, under its provision the State would receive somewhat over $2,000,000.

A bill also has been introduced in the Senate for readjustment of interest due this and other States on account of the war of 1812 on the same basis that settlements were made under the provisions of acts of Congress with Maryland, Massachusetts and other States. Under the provisions of this bill New York would receive over $100,000.

Other bills will be introduced as early as practicable or when it is thought they can be presented without embarrassing bills involving the interests of the State, already pending, for refunding the interest on Comptroller's bonds and the expenditures for defense of the Canadian frontier in 1864, unless general legislation so modifies the laws and rules governing the accounting officers of the treasury that these claims can be taken up and allowed.

Very respectfully, your obedient servant.

J. G. FARNSWORTH.

STATE CLAIMS.

TREASURY DEPARTMENT, THIRD AUDITOR'S OFFICE,
WASHINGTON, D. C., *February* 3, 1887.

General J. G. FARNSWORTH, *Arlington Hotel, City:*

SIR.—I have the honor to inform you that settlements have been made on the third, sixth and ninth installments of the war claims of the State of New York, and the sum of twenty-two thousand five hundred and fifty-nine (22,559) dollars and eighty-four (84) cents found due said State under act of Congress, approved July 27, 1861.

The amount has been placed to the credit of the State of New York on the books of this office, to await an appropriation by Congress for the payment of the same.

Very respectfully.

JOHN S. WILLIAMS,
Auditor.

TREASURY DEPARTMENT, THIRD AUDITOR'S OFFICE,
WASHINGTON, D. C., *November* 9, 1887.

SIR.—I have to inform you that a settlement of the war claims of the State of New York — fifth installment — for expenses incurred in raising volunteers, 1861–5, has been made in this office, and the sum of $24,438.73, found due said State under act of Congress, approved July 27, 1861.

The settlement has been approved by the Second Comptroller of the Treasury, to whom, according to law, all the papers were referred for decision.

The amount has been placed to the credit of the State of New York, on the books of this office, to await an appropriation by Congress for the payment of the same.

Very respectfully.

JOHN S. WILLIAMS,
Auditor.

General J. G. FARNSWORTH,
New York State Agent, Albany, N. Y.

TREASURY DEPARTMENT, THIRD AUDITOR'S OFFICE,
WASHINGTON, D. C., *December* 9, 1887.

SIR.—I have to inform you that a settlement of the war claims of the State of New York — seventh installment — for expenses incurred in raising volunteers, 1861–5, has been made in this office, and the sum of $2,508.89, found due said State under act of Congress, approved July 27, 1861.

The settlement has been approved by the Second Comptroller of the Treasury, to whom, according to law, all the papers are referred for decision.

The amount has been placed to the credit of the State of New York, on the books of this office, to await an appropriation by Congress, for the payment of the same.

Very respectfully.

JOHN S. WILLIAMS,
Auditor.

General J. G. FARNSWORTH,
New York State Agent, Albany, N. Y.

TREASURY DEPARTMENT, THIRD AUDITOR'S OFFICE,
WASHINGTON, D. C., *December* 12, 1887.

SIR :—I have to inform you that a settlement of the war claims of the State of New York — fourth installment — for expenses incurred in raising volunteers, 1861–5, has been made in this office and the sum of $3,671.48 found due said State under act of Congress, approved July 27, 1861.

The settlement has been approved by the Second Comptroller of the treasury, to whom, according to law, all the papers were referred for decision. The amount has been placed to the credit of the State of New York on the books of this office, to await an appropriation by Congress for the payment of the same.

Very respectfully, etc.

JOHN S. WILLIAMS,
Auditor.

General J. G. FARNSWORTH,
New York State Agent, Albany, N. Y.

TREASURY DEPARTMENT, SECOND COMPTROLLER'S OFFICE,
WASHINGTON, D. C., *December* 22, 1887.

General J. G. FARNSWORTH, *Albany, N. Y.*

DEAR SIR.— Your attention is called to the fact that I have this day certified as due the State of New York the sum of $7,460, under the act of July 27, 1861 — eighth installment — being the amount paid by the State, under the act of its Legislature, 1877, to reimburse the Ninth (9th) Regiment, New York State militia, now Ninth Regiment, National Guards, State of New York, for equipments expended in the service of the United States while mustered into such service as the Ninth New York militia, and Eighty-third New York volunteers.

Very respectfully,

SIGOURNEY BUTLER,
Comptroller.

WAR CLAIM ACCOUNT.

THE UNITED STATES IN ACCOUNT WITH THE STATE OF NEW YORK.

1862.	*Dr.*	
May 22.	To amount of first installment of claims filed	$2,782,688 42
July 31.	To amount of second installment of claims filed	167,791 04
1867.		
Dec. 2.	To amount of third installment of claims filed	281,845 86
1872.		
Jan. 2.	To amount of fourth installment of claims filed	364,107 07
Sept. 2.	To amount of fifth installment of claims filed	866,413 13
1873.		
Dec. 3.	To amount of sixth installment of claims filed	341,580 10
1874.		
June 27.	To amount of seventh installment of claims filed	197,537 76
1877.		
June 23.	To amount of eighth installment of claims filed	21,956 11
1883.		
Oct. 3.	To amount of ninth installment of claims filed	77,954 30
	Total	$5,101,873 79
	To balance brought forward	$1,017,936 41

THE UNITED STATES IN ACCOUNT WITH THE STATE OF NEW YORK.

1861.	*Cr.*	
July 31.	By cash for carbines purchased, duties on arms, etc	$45,371 11
Sept. 17.	By cash	1,113,000 00
1865.		
Sept. 27.	By cash	262,763 17
1867.		
June 4.	By amount allowed and carried to the credit of the State on account of direct tax	879,058 22

1870.			
Sept. 23.	By amount allowed and carried to the credit of the State, as follows:		
	On account of Quartermaster's department	$41,220 83	
	On account of Ira Harris Hospital	702 90	
	On account of direct tax	37,260 72	
			$79,184 45
1871.			
May 25.	By amount allowed and carried to the credit of the State on account of direct tax		194,799 15
June 27.	By amount allowed and carried to the credit of the State on account of direct tax		348,295 50
1872.			
Dec. 10.	By sales of property		1,092 50
Dec. 10.	By amount allowed and carried to the credit of the State on account of direct tax		272,687 02
	By cash		192,650 31
1873.			
May 17.	By cash		107,498 08
1875.			
Dec. 21.	By amount allowed and carried to the credit of the State, as follows:		
	On account of direct tax	$81,230 25	
	On general account	640 03	
			81,870 28
1876.			
Nov. 27.	By amount allowed and carried to the credit of the State, as follows:		
	On account of Surgeon-General's department	$24,336 80	
	Cash paid into treasury of the State	56,407 77	80,744 57
1877.			
June 23.	By amount allowed and paid into treasury of the State		41,138 50
1878.			
April 18.	By amount allowed and paid into treasury of the State		82,736 78
1879.			
May 22.	By amount allowed and paid into treasury of the State		20,539 42

1879.		
July 30.	By amount allowed and paid into treasury of the State	$23,809 53
Nov. 24.	By amount allowed and paid into treasury of the State	17,510 00
1880.		
Aug. 5.	By amount allowed and paid into treasury of the State	21,421 13
1882.		
Jan 5.	By amount allowed and paid into treasury of the State	83,344 35
1884.		
April 7.	By amount allowed and paid into treasury of the State	54,946 52
1886.		
Aug. 18.	By amount allowed and paid into treasury of the State	18,837 85
1887.		
Feb. 6.	By amount allowed *	22,559 84
Nov. 9.	By amount allowed *	24,438 73
Dec. 9.	By amount allowed *	2,508 89
Dec. 12.	By amount allowed *	3,671 48
Dec. 22.	By amount allowed *	7,460 00
	By balance carried forward	1,017,936 41
	Total	$5,101,873 79

* Awaiting appropriation by Congress.

(L.)

STATEMENT OF DISBURSEMENTS.

Expended for services of Adjutant-General, Assistant Adjutants-General, Clerks and Messengers, from January 1, 1887, to January 1, 1888.

January	$1,216 66
February	1,216 66
March	1,216 68
April	1,216 66
May	1,216 66
June	1,217 68
July	1,216 66
August	1,216 66
September	1,216 68
October	1,569 44
November	1,299 99
December	1,300 02
	$15,119 45

Expenditures of Adjutant-General's Department, from January 1, 1887, to January 1, 1888, including cost of tactical books, printing, expressage, traveling expenses, telegraphing, etc.

January, paid for December, 1886		$156 01
January, ordinary expenses	$466 94	
January, printing, Weed, Parsons & Co.	752 50	
		1,219 44
February		137 02
March		330 82
April		202 57
May		913 11
June, ordinary expenses	$390 11	
June, rent late Second Division headquarters,	125 00	
		515 11

July		$122 40
August		269 60
September, ordinary expenses	$197 16	
September, printing, Weed, Parsons & Co...	1,411 81	
		1,608 97
October		413 63
November		808 32
		$6,697 00

Expended for services of Assistant Inspectors-General and Clerks, from January 1, 1887, to January 1, 1888.

January, paid for December, 1886	$279 16
January	279 16
February	279 16
March	279 16
April	279 16
May	351 16
June	331 17
July	279 16
August	335 17
September	279 17
October	335 16
November	299 16
December	356 16
	$3,982 11

Expenditures of Inspector General's Department, from January 1, 1887, to January 1, 1888, including traveling expenses, printing, expressage, telegraphing, etc.

January, paid for December, 1886	$213 36
January	60 05
February	114 91
March	183 09
April	115 39
May	337 09
June	294 39
July	51 37
August	353 84
September	116 47

October	$114 66
November	80 85
December	262 39
	$2,297 86

Expended for services of the General Inspector of Rifle Practice and Clerks, from January 1, 1887, to January 1, 1888.

January, paid for December, 1886	$200 00
January	241 66
February	241 66
March	241 66
April	241 66
May	241 66
June	241 66
July	241 66
August	241 66
September	241 66
October	241 66
November	241 66
December	241 66
	$3,099 92

Expenditures in the Department of Rifle Practice, from January 1, 1887, to January 1, 1888, including traveling expenses, State prizes, pay of scorers, stationery, printing, telegraphing, expressage, etc.

January, paid for December, 1886	$1,139 00
January	208 30
February	113 50
March	369 60
April	109 89
May	579 83
June	378 92
July	195 66
August	167 83
September	881 63
October	113 91
November	172 85
December	1,453 03
	$5,883 95

Expended for services of Chief of Ordnance, Assistant Chief of Ordnance, Clerks, Workmen and Messengers, from January 1, 1887, to January 1, 1888.

January	$1,504 99
February	1,406 99
March	1,414 99
April	1,406 99
May	1,440 99
June	1,295 99
July	1,517 99
August	1,420 99
September	1,418 99
October	1,400 99
November	1,323 99
December	1,387 99
	$16,941 88

Expended by Chief of Ordnance for purchase of issues to the National Guard, from January 1, 1887, to January 1, 1888, of service uniforms, helmets, caps, drums, drum material, knapsacks, equipments, flags, etc.

January	$4,291 24
February	2,050 76
March	14,329 45
April	3,182 18
May	1,845 00
June	2,783 99
July	6,460 18
August	5,431 42
September	2,009 40
October	2,602 20
November	2,626 84
	$47,612 66

Expenditures of Ordnance Department, from January 1, 1887, to January 1, 1888, including traveling expenses, stationery, printing, telegraphing, expressage, purchase of articles to repair State property, etc.

January	$395 17
February	666 63
March	619 79

April	$307 00
May	465 37
July	519 41
August	162 04
September	485 34
October	354 28
November	503 30
November, transportation of troops to Philadelphia centennial celebration	11,298 19
December	1,026 88
	$16,803 40

Expended from January 1, 1887, to January 1, 1888, to aid officers, in procuring their arms and equipments, pursuant to section 52, Military Code.

January	$770 00
April	980 00
August	1,360 00
October	670 00
November	560 00
December	480 00
	$4,820 00

Expended in allowance to Brigade Headquarters, from January 1, 1887, to January 1, 1888, pursuant to section 97, Military Code.

First Brigade		$975 00
Second Brigade (from June 1, 1886, to December 1, 1886,)	$375 00	
Second Brigade	975 00	
		1,350 00
Third Brigade		772 50
Fourth Brigade		979 35
Sixth Brigade (old)		138 05
		$4,214 90

Expended in allowance to Regimental and Battalion Headquarters, from January 1, 1887, to January 1, 1888, pursuant to section 97, Military Code.

Seventh Regiment	$250 00
Ninth Regiment	250 00
Tenth Battalion	112 75
Eleventh Regiment	250 00
Twelfth Regiment	250 00
Thirteenth Regiment	250 00
Twenty-second Regiment	250 00
Twenty-third Regiment	250 00
Forty-seventh Regiment	250 00
Sixty-fifth Regiment	249 98
Seventy-first Regiment	250 00
Seventy-fourth Regiment	250 00
	$2,862 73

Expended in Appropriations to Rifle Associations or Ranges, from January 1, 1887, to January 1, 1888.

National Rifle Association	$4,000 00
Albany (Rensselaerwyck) rifle range	650 00
Buffalo (Bay View) rifle range, rent	500 00
Buffalo (Bay View) rifle range, repairs	180 00
Oswego rifle range	25 00
Oneonta rifle range	50 00
Newburgh rifle range	50 00
Binghamton rifle range	50 00
Glens Falls rifle range	50 00
Kingston rifle range	50 00
Rochester rifle range	50 00
Poughkeepsie rifle range	100 00
Elmira rifle range	100 00
Penn Yan rifle range, construction	200 00
Schenectady rifle range	30 00
Niagara rifle range	50 00
Watertown rifle range	50 00
Auburn rifle range	81 00
	$6,266 00

Expended for Services and Expenses of Courts-Martial, Delinquency Courts and Boards of Examination, from January 1, 1887 to January 1, 1888.

Board to recommend style of overcoats for the National Guard		$307 85
First Brigade	$64 00	
First Brigade	270 93	
First Brigade	34 50	
		369 43
Second Brigade		52 00
Third Brigade	$62 00	
Third Brigade	93 75	
		155 75
Fourth Brigade		152 00
Fifth Battery		23 00
Thirteenth Regiment	$369 80	
Thirteenth Regiment	826 75	
		1,196 55
Second Separate Company		21 65
Seventh Separate Company		41 70
Forty-first Separate Company		40 65
State Board of Examination	$88 90	
State Board of Examination	54 50	
State Board of Examination	105 10	
		248 50
		$2,609 08

STATEMENT *of Military Funds Appropriated to Organizations of the National Guard, from January* 1, 1887, *to January* 1, 1888, *pursuant to section* 98, *Military Code.*

ORGANIZATION.	On percentage of present at five parades.	General appropriation to batteries and separate companies.	Total.
Seventh Regiment	$13,448 00	.....	$13,448 00
Eighth Regiment	2,110 40	.....	2,110 40
Ninth Regiment	2,792 00	.....	2,792 00
Tenth Battalion	2,817 60	.....	2,817 60
Eleventh Regiment	5,387 20	.....	5,387 20
Twelfth Regiment	8,101 95	.....	8,101 95
Thirteenth Regiment	3,971 20	.....	3,971 20
Fourteenth Regiment	3,412 40	.....	3,412 40
Twenty-second Regiment	7,640 00	.....	7,640 00
Twenty-third Regiment	8,543 32	.....	8,543 32
Thirty-second Regiment	2,405 40	.....	2,405 40
Forty-seventh Regiment	2,851 20	.....	2,851 20
Sixty-fifth Regiment	5,385 60	.....	5,385 60
Sixty-ninth Regiment	9,600 00	.....	9,600 00
Seventy-first Regiment	6,134 40	.....	6,134 40
Seventy-fourth Regiment	2,404 80	.....	2,404 80
First Battery	1,409 60	$1,500 00	2,909 60
Second Battery	1,241 60	1,500 00	2,741 60
Third Battery	401 60	750 00	1,151 60
Fourth Battery	379 20	750 00	1,129 20
Fifth Battery	512 00	750 00	1,262 00
Sixth Battery	481 60	750 00	1,231 60
First Separate Co.	377 60	250 00	627 60
Second Separate Co	681 60	250 00	931 60
Third Separate Co	942 40	500 00	1,442 40
Fourth Separate Co	427 00	250 00	677 00
Fifth Separate Co.	328 00	250 00	578 00
Sixth Separate Co.	753 60	250 00	1,003 60
Seventh Separate Co	478 40	250 00	728 40
Eighth Separate Co	520 00	250 00	770 00
Ninth Separate Co	264 00	250 00	514 00
Tenth Separate Co.	356 80	250 00	606 80
Eleventh Separate Co	400 00	250 00	650 00
Twelfth Separate Co	568 00	250 00	818 00
Thirteenth Separate Co.	356 80	250 00	606 80
Fourteenth Separate Co	444 80	250 00	694 80
Fifteenth Separate Co.	334 00	250 00	584 00
Sixteenth Separate Co	329 00	250 00	579 00
Seventeenth Separate Co.	324 80	250 00	574 80
Eighteenth Separate Co	320 00	250 00	570 00
Nineteenth Separate Co.	716 80	250 00	966 80
Twentieth Separate Co	384 00	250 00	634 00
Twenty-first Separate Co.	534 40	250 00	784 40

STATEMENT *of Military Funds appropriated, etc.*— (Continued).

ORGANIZATION.	On percentage of present at five parades.	General appropriation to batteries and separate companies.	Total.
Twenty-second Separate Co.	$481 60	$250 00	$731 60
Twenty-third Separate Co...	438 40	250 00	688 40
Twenty-fourth Separate Co.	244 80	250 00	494 80
Twenty-fifth Separate Co...	256 00	250 00	506 00
Twenty-sixth Separate Co...	1,484 80	500 00	1,984 80
Twenty-seventh Separate Co.	475 20	250 00	725 20
Twenty-eighth Separate Co.	291 20	250 00	541 20
Twenty-ninth Separate Co..	320 00	250 00	570 00
Thirtieth Separate Co.....	481 60	250 00	731 60
Thirty-first Separate Co	369 60	250 00	619 60
Thirty-second Separate Co..	1,120 00	500 00	1,620 00
Thirty-third Separate Co...	427 20	250 00	677 20
Thirty-fourth Separate Co ..	411 20	250 00	661 20
Thirty-fifth Separate Co....	532 80	250 00	782 80
Thirty-sixth Separate Co....	406 40	250 00	656 40
Thirty-seventh Separate Co.	342 40	250 00	592 40
Thirty-eighth Separate Co..	361 60	250 00	611 60
Thirty-ninth Separate Co...	982 40	500 00	1,482 40
Fortieth Separate Co.....	345 60	250 00	595 60
Forty-first Separate Co.....	368 00	250 00	618 00
Forty-second Separate Co ..	1,355 20	500 00	1,855 20
	$112,769 07	$17,750 00	$130,519 07

Amounts Expended in connection with the Camp of Instruction, near Peekskill, N. Y.

Blank cartridges and cartridge bags	$2,085 00
Candles, candlesticks, oil, lanterns, etc	527 60
Tin-plating knives and forks	110 44
New blankets	1,435 78
Cots, mattresses and stools	919 00
Pails, brooms and rakes	243 95
Wheelbarrows, mallets, etc	105 00
Crockery	318 50
Coal for pump	24 00
Hardware, nails, spades, etc	264 91
Hay, oats, straw and seed	223 75
Lumber and carpenter work	133 50
Medical supplies, disinfectants	602 09
Assistance, medical department	50 00

Transportation, camp equipage and stores	$557 00
Carting camp equipage and baggage of troops from dock to camp ground and return, services, engineer, labor, express charges, freight, disinfectors, scavengers, stationery, telegrams, hire of ambulance, etc., etc.	3,947 51
Transportation troops to and from camp	5,957 79
Subsistence of troops	34,510 63
Hire of horses for use of field officers	638 00
Watchman	600 00
Pay of troops, drawn from Comptroller	53,000 00
	$106,254 45

Special Expenditure.

Pay of troops attending Centennial celebration at Philadelphia — amount drawn from Comptroller	$15,000 00

Recapitulation of amounts expended from the General Fund.

Total amount expended, as per cash-book	$390,984 46

Adjutant-General, services	$15,119 45
Adjutant-General, expenditures	6,697 00
Inspector-General, services	3,982 11
Inspector-General, expenditures	2,297 86
General Inspector of Rifle Practice, services	3,099 92
General Inspector of Rifle Practice, expenditures	5,883 95
Chief of Ordnance, services	16,941 88
Chief of Ordnance, purchases	47,612 66
Chief of Ordnance, expenditures	16,803 40
Allowance to officers, section 52, Military Code	4,820 00
Allowance to brigade headquarters, section 97, Military Code	4,214 90
Allowance to regimental and battalion headquarters, section 97, Military Code	2,862 73
Appropriations to rifle ranges	6,266 00
Courts-martial and boards of examination	2,609 08
Allowance to organizations, section 97, Military Code	130,519 07
State Camp of Instruction, near Peekskill	106,254 45
Pay of troops, Philadelphia Centennial celebration	15,000 00
	$390,984 46

Military Record Fund, salary of keeper and janitor in Bureau of Military Statistics.

January	$130 00
February	130 00
March	130 00
April	130 00
May	130 00
June	130 00
July	130 00
August	130 00
September	130 00
October	130 00
November	130 00
December	130 00
	$1,560 00

Expended for services and traveling expenses from January 1, 1887, to January 1, 1888, in prosecuting war claims against United States Government under chapter 330, Laws of 1886.

January	$389 35
February	399 20
March	307 90
April	280 00
May	358 36
June	333 80
July	327 65
August	303 85
September	298 95
October	347 52
November	335 90
December	356 27
	$4,038 75

Expended by Chief of Ordnance from January 1, 1887, to January 1, 1888, for repairing State arsenals or armories at New York city, Buffalo, Albany, Schenectady, Utica, Syracuse, Auburn, Rochester, Oswego, Watertown, Binghamton, Troy, Kingston, Oneonta and Walton, and for salary and traveling expenses superintending repairs.

January	$285 34
February	102 30
March	261 17
April	432 00
May	749 23
July	274 75
August	241 61
September	105 00
October	1,094 54
November	834 53
December	86 57
	$4,467 04

Expenditures in erection of State armories under direction of the Adjutant-General, Inspector-General and Chief of Ordnance, Commissioners, appointed by the acts making the several appropriations.

Troy armory (chap. 330, Laws of 1886)	$5,018 70
Troy armory (chap. 330, Laws of 1886)	600 55
Elmira armory (chap. 455, Laws of 1885)	3,988 19
Elmira armory (chap. 455, Laws of 1885)	3,827 00
Elmira armory (chap. 283, Laws of 1887)	3,440 24
Elmira armory (chap. 283, Laws of 1887)	3,694 50
Newburgh armory (chap. 330, Laws of 1887)	4,018 27
Newburgh armory (chap. 330, Laws of 1887)	424 14
Newburgh armory (chap. 330, Laws of 1887)	524 28
Walton armory (chaps. 429, Laws of 1885, and 482, Laws of 1886)	4,421 15
Walton armory (chaps. 429, Laws of 1885, and 482, Laws of 1886)	256 80
Oneonta armory (chap. 299, Laws of 1886)	1,015 75
Oneonta armory (chap. 299, Laws of 1886)	1,000 00
Oneonta armory (chap. 299, Laws of 1886)	1,456 50
	$33,686 07

Expended for the improvement of the State camp ground under the direction of the Adjutant-General, Inspector-General, and Chief of Ordnance, Commissioners, appointed by chapter 460, *Laws of* 1887.

March	$273 12
May	7,320 21
June	2,629 10
July	3,514 41
August	11,699 21
September	94 00
November	635 30
	$26,165 35

Expended for making map of State camp ground under chapter 460, *Laws of* 1887.

June	$250 00

Expended for transportation of troops to Saratoga, acting as escort to Society of the Army of the Potomac, under chapter 488, *Laws of* 1887.

August	$7,500 00

CONTINGENT FUND.

Jan. 1, 1888. Balance on hand	$1,739 98

ANNUAL REPORT

OF THE

SUPERINTENDENT

OF THE

ONONDAGA SALT SPRINGS,

FOR THE YEAR 1887.

TRANSMITTED TO THE LEGISLATURE JANUARY 24, 1888

THE TROY PRESS COMPANY, PRINTERS.
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No. 34.

IN ASSEMBLY.

JANUARY 24, 1888.

ANNUAL REPORT

OF THE

SUPERINTENDENT OF THE ONONDAGA SALT SPRINGS, FOR THE YEAR 1887.

SUPERINTENDENT'S OFFICE,
SYRACUSE, *January* 15, 1888.

To the Hon. FREMONT COLE,
Speaker of the Assembly:

SIR.—I have the honor to transmit to the Legislature, my Annual Report as Superintendent of the Onondaga Salt Springs, exhibiting the state of the manufacture of salt, and the condition of the work.

P. J. BRUMMELKAMP,
Superintendent.

REPORT.

OFFICE OF THE ONONDAGA SALT SPRINGS,
SYRACUSE, *January* 14, 1888.

In obedience to the statute, chapter 346, Laws of 1859, which requires the Superintendent of the Onondaga Salt Reservation to report to the Legislature the quantity of salt manufactured, the moneys expended for producing the same, the revenues derived therefrom, and the condition of the structures and machinery under his supervision, and the recommendation of such improvements, as he deems necessary, for the promotion and future welfare of the interests of the State over which he is in charge, submits to your honorable body the following:

INSPECTION OF SALT.

The whole amount of salt inspected on the Onondaga Salt Springs Reservation, in and near the city of Syracuse, during the year 1887, is five million six hundred and ninety-five thousand seven hundred and ninety-seven (5,695,797) bushels; of this amount, 2,576,823 bushels have been produced in the fine salt works by artificial heat, and 3,118,974 bushels in the coarse salt works by solar evaporation. The inspection in the several districts into which the reservation is divided has been as follows:

SYRACUSE — *District No.* 1.

Fine salt	713,606
Solar salt	848,176
Solar ground	119,374
Ground dairy	20,157
Total	1,701,313

SALINA — *District No.* 2.

Fine salt	618,366
Solar salt	178,888
Solar ground	15,795
Ground dairy	12,244
Total	825,293

LIVERPOOL — *District No.* 3.

Fine salt	45,775
Solar salt	1,044,180
Total	1,089,955

GEDDES — *District No.* 4.

Fine salt	806,402
Solar salt	912,561
Ground dairy	360,273
Total	2,079,236
Total inspection as above in bushels	5,695,797

The revenues collected by the superintendent during the year are as follows:

Duties on 5,695,797 bushels is	$56,957 97
Received for fractional weights	14
Received for rents	104 00
	$57,062 11

Agreeably with instructions, the revenues collected have been deposited to the credit of the State Treasurer, as follows:

In the First National Bank	$25,370 18
In the Merchants' National Bank	31,691 93
	$57,062 11

There has been drawn from the Treasury during the same period for the support of the salt springs the sum of, $54,507 59

Cash on hand January 1, 1887 8,295 01

$62,802 60

Which has been disbursed as follows:

For salaries of officers	$22,267 96
For new structures, machinery, repairs, labor, material, etc., etc.	38,293 15
	$60,561 11

The following statement, in detail, approximates as near as may be to the different objects of expenditures, the original vouchers for which have, from time to time been forwarded to the Comptroller, and copies of the same filed for reference in the office of the superintendent at Syracuse:

SYRACUSE — *First District.*

Salaries of officers	$10,715 92
Labor and teaming	4,162 24
Machinery and repairs	7,008 94
Hardware and oil	1,092 77
Coal	14,105 15
Engineers	5,304 15
Rent of inspector's office at Geddes for 1887	150 00
Cable wires	247 50
Iron pipe	1,196 33
Paid Carroll & Gehm for use of land on Salina marsh,	100 00
Miscellaneous	1,039 96
	$45,122 96

SALINA — *District No. 2.*

Salaries	$4,405 00
Labor and teaming	1,961 03
Miscellaneous	248 99
	$6,615 02

LIVERPOOL — *District No. 3.*

Salaries	$2,600 04
Labor and teaming	80 79
Miscellaneous	55 41
	$2,736 24

GEDDES—*District No.* 4.

Salaries	$4,547 00
Labor and teaming	1,423 56
Miscellaneous	116 33
	$6,086 89
Total expenditures	$60,561 11
Cash on hand January 1, 1888	2,241 49
	$62,802 60

RECAPITULATION.

Total amount of expenditures	$60,561 11
Total amount of revenue	57,062 11
Expenditures over receipts	$3,499 00

The following tables show in detail the production and other business statistics of this office for the past year:

A.

Salt inspected at the Onondaga Salt Springs in 1887.

Syracuse District	848,176	713,606	20,157	119,374	1,701,313
Salina District	178,888	618,366	12,244	15,795	825,293
Liverpool District	1,044,180	45,775	.....	.....	1,089,955
Geddes District	912,561	806,402	360,292	.....	2,079,236
Totals	2,983,805	2,184,149	392,693	135,169	5,695,797

B.

Salt inspected at Syracuse District No. 1 *for* 1887.

DATE.	Solar.	Fine.	Ground dairy.	Ground solar.	Aggregate.
January	17,879	20,815	2,825	3,336	44,855
February	12,226	17,914	1,065	4,051	35,256
March	47,686	24,491	3,771	9,013	84,951
April	40,804	8,212	1,248	4,925	55,189
May	85,965	38,341	2,712	6,186	133,205
June	63,369	110,014	751	12,498	186,632
July	98,502	89,646	.....	6,637	194,786
August	85,311	82,689	270	7,377	175,647
September	94,283	86,996	638	24,971	206,888
October	118,414	91,114	.....	13,344	222,872
November	103,088	93,278	.....	19,934	216,300
December	80,649	50,096	6,877	7,100	144,722
Totals	848,176	713,606	20,157	119,374	1,701,313

C.

Salt inspected at Salina District No. 2, for 1887.

DATE.	Solar.	Fine.	Ground dairy.	Ground solar.	Aggregate.
January	40,037	34,161	5,097	2,927	82,222
February	31,199	36,328	987	4,450	72,964
March	34,888	64,014	3,550	4,435	106,887
April	3,864	44,772	1,043	3,983	53,662
May	5,276	24,550	.....	.....	29,826
June	17,342	78,168	.....	.....	95,510
July	5,122	62,457	.....	.....	67,579
August	9,684	62,990	.....	.....	72,674
September	14,864	55,257	223	.....	70,344
October	13,398	78,658	878	.....	92,934
November	3,214	57,970	.....	.....	61,184
December	.....	19,041	466	.....	19,507
Totals	178,888	618,366	12,244	15,795	825,293

D.

Salt inspected at Liverpool District No. 3, for 1887.

DATE.	Coarse.	Fine.	Aggregate.
January	57,996	119	58,115
February	16,129	326	16,455
March	90,257	115	90,372
April	43,278	936	44,214
May	41,593	4,528	46,121
June	156,190	9,941	166,131
July	207,511	8,056	215,567
August	56,968	2,568	59,536
September	51,473	17,425	68,898
October	72,133	127	72,260
November	123,713	1,500	125,213
December	126,939	134	127,073
Totals	1,044,180	45,775	1,089,955

E.

Salt inspected at Geddes District No. 4 for 1887.

	Solar.	Fine.	Ground dairy.	Aggregate.
January	109,411	34,713	20,944	165,068
February	73,920	29,074	24,810	127,804
March	62,110	67,282	37,960	167,352
April	6,849	18,292	18,827	43,968
May	47,084	89,085	46,540	182,709
June	34,099	119,589	34,204	187,892
July	104,708	65,763	31,054	201,525
August	103,759	153,644	27,591	284,994
September	92,359	82,939	28,567	203,865
October	92,940	43,649	29,915	166,504
November	78,869	70,845	32,224	181,938
December	106,453	31,527	27,637	165,617
Totals	912,561	806,402	360,273	2,079,236

F.

Table showing the net revenue derived from the manufacture of salt and paid into the General Fund since the duties were reduced to one cent per bushel.

Years.	Amount.
1846	$7,705 48
1847	9,717 63
1848	21,491 46
1849	20,153 69
1850	15,104 87
1851	13,337 55
1852	19,284 61
1853	29,557 19
1854	23,711 57
1855	10,867 46
1856	9,690 79
1857 (deficit $6,603.01)	
1858	19,766 93
1859	27,306 38
1860	12,342 50
1861	26,761 28
1862	49,696 21
1863	38,064 94
1864	29,906 96
1865	18,620 59
1866	24,557 48
1867	25,089 73
1868	37,244 06
1869	41,211 09
1870	24,411 38
1871	34,507 08
1872	33,991 78
1873	15,130 42
1874	3,106 88
1875	5,903 66
1876	4,871 08
1877	7,422 99
1878	14,803 43
1879	23,221 62
1880	1,313 30

Years.		Amount.
1881		20,045 52
1882		21,204 30
1883		4,056 03
1884		3,452 55
1885		5,349 59
1886 (deficit	$7,011 79)	
1887 (deficit	3,499 00)	
Total		$736,868 26
Also amount paid by Comptroller on account of expenditures contracted previous to March 1, 1887,		68,200 00
		$668,668 26

G.

The following is a statement of the number of bushels of salt made at the Onondaga Salt Springs since June 20, 1797, *which is the date of the first leases in lots:*

DATE.	Solar.	Fine.	Aggregate bushels.	Superintendents.
1797	.....	25,474	25,474	William Stevens.
1798	.....	59,928	59,928	William Stevens.
1799	.....	42,704	42,704	William Stevens.
1800	.....	50,000	50,000	William Stevens.
1801	.....	62,000	62,000	Sheldon Logan.
1802	.....	75,000	75,000	Asa Danforth.
1803	.....	90,000	90,000	Asa Danforth.
1804	.....	100,000	100,000	Asa Danforth.
1805	.....	154,071	154,071	William Kirkpatrick.
1806	.....	122,577	122,577	William Kirkpatrick.
1807	.....	175,448	175,448	P. H. Ransom.
1808	.....	319,618	319,618	Nathan Stewart.
1809	.....	128,282	128,282	John Richardson.
1810	.....	452,050	452,050	William Kirkpatrick.
1811	.....	200,000	200,000	William Kirkpatrick.
1812	.....	221,011	221,011	William Kirkpatrick.
1813	.....	226,000	226,000	William Kirkpatrick.
1814	.....	295,000	295,000	William Kirkpatrick.
1815	.....	322,058	322,058	William Kirkpatrick.
1816	.....	348,655	348,655	William Kirkpatrick.
1817	.....	408,655	408,655	William Kirkpatrick.
1818	.....	406,540	406,540	William Kirkpatrick.
1819	.....	548,374	548,374	William Kirkpatrick,
1820	.....	458,329	458,329	William Kirkpatrick.
1821	.....	526,049	526,049	William Kirkpatrick.
1822	.....	481,562	481,562	William Kirkpatrick.
1823	.....	726,988	726,988	William Kirkpatrick.
1824	.....	816,634	816,634	William Kirkpatrick.
1825	.....	757,203	757,203	William Kirkpatrick.
1826	.....	811,023	811,023	William Kirkpatrick.
1827	.....	983,410	983,410	William Kirkpatrick.
1828	.....	1,160,888	1,160,888	William Kirkpatrick.
1829	.....	1,129,280	1,129,280	William Kirkpatrick.
1830	.....	1,435,446	1,435,446	William Kirkpatrick.
1831	.....	1,514,037	1,514,037	N. H. Earll.
1832	.....	1,652,985	1,652,985	N. H. Earll.
1833	.....	1,838,646	1,837,646	N. H. Earll.
1834	.....	1,943,252	1,943,252	N. H. Earll.
1835	.....	1,209,867	1,209,867	N. H. Earll.
1836	.....	1,912,858	1,912,858	Rial Wright.
1837	.....	2,167,287	2,167,287	Rial Wright.
1838	.....	2,575,033	2,575,033	Rial Wright.
1839	.....	2,864,718	2,864,718	Rial Wright.
1840	.....	2,621,805	2,621,305	Thomas Spencer.
1841	220,247	3,120,230	3,340,767	Thomas Spencer.
1842	163,021	2,128,882	2,291,903	Thomas Spencer.
1843	318,105	2,809,395	3,127,500	Rial Wright.
1844	332,418	2,968,136	4,300,554	Rial Wright.
1845	353,455	3,408,903	3,762,358	Enoch Marks.
1846	331,705	3,507,146	3,838,851	Enoch Marks.
1847	262,879	3,688,476	3,951,355	Enoch Marks.
1848	342,497	3,994,629	4,737,126	Robert Gere.
1849	377,735	4,705,834	5,083,569	Robert Gere.
1850	374,732	3,894,187	4,268,919	Robert Gere.
1851	378,967	4,235,150	4,614,117	Robert Gere.
1852	633,595	4,288,938	4,922.533	Hervey Rhodes.
1853	577,947	4,826,577	5,404,524	Hervey Rhodes.
1854	734,474	5,068,873	5,803,347	Hervey Rhodes.
1855	498,124	5,584,761	6,082,885	Vivus W. Smith.
1856	709,391	5,257,419	5,966,810	Vivus W. Smith.
1857	481,280	3,830,846	4,312,126	Vivus W. Smith.
1858	1,514,554	5,518,665	7,033,391	Vivus W. Smith.
1859	1,345,022	5,549,250	6,894,271	Vivus W. Smith.
1860	1,452,565	4,130,682	5,593,247	Vivus W. Smith.
1861	1,884,697	5,315,549	7,200,391	Vivus W. Smith.
1862	1,983,022	7,070,852	9,053,874	Vivus W. Smith.
1863	1,437,656	6,504,727	7,942,383	Vivus W. Smith.
1864	1,971,122	5,407,712	7,378,834	Vivus W. Smith.

Statement of the number of bushels of salt made at the Onondaga Salt Springs since June 20, 1797 — (Continued).

DATE.	Solar.	Fine.	Aggregate bushels.	Superintendents.
1865	1,886,760	4,499,170	6,385,930	George Geddes.
1866	1,978,883	5,180,320	7,158,503	George Geddes.
1867	2,271,892	5,323,673	7,595,565	George Geddes.
1868	2,027,490	6,639,126	8,666,616	George Geddes.
1869	1,857,942	6,804:285	8,662,237	George Geddes.
1870	2,847,691	6,260,422	8,748,115	George Geddes.
1871	2,464,404	5,910,492	8,374,956	John M. Strong.
1872	1,882,604	6,048,321	7,930,925	John M. Strong.
1873	1,691,359	5,768,998	7,460,357	John M. Strong.
1874	1,667,368	4,361,932	6,029,300	A. C. Powell.
1875	2,655,955	4,523,491	7,179,446	A. C. Powell.
1876	2,308,679	3,083,998	5,392,667	A. C. Powell.
1877	2,525,335	3,902,648	6,427,983	A. C. Powell.
1878	2,788,754	4,387,443	7,176,197	A. C. Powell.
1879	2,957,744	5,364,418	8,322,162	A. C. Powell, eight months. C. G. Hinkley, four months.
1880	2,516,485	5,482,265	7,998,750	N. Stanton Gere.
1881	3,011,461	4,905,775	7,917,236	N. Stanton Gere.
1882	3,032,447	5,307,773	8,340,180	N. Stanton Gere.
1883	2,470,533	5,432,439	7,902,972	P. J. Brummelkamp.
1884	2,353,860	4,588,409	6,942,269	P. J. Brummelkamp.
1885	2,439,332	4,494,967	6,934,299	P. J. Brummelkamp.
1886	2,772,348	3,329,409	6,101,757	P. J. Brummelkamp.
1887	3,118,974	2,576,823	5,695,797	P. J. Brummelkamp.

H.

The yield of solar salt per cover.

COMPANIES.	1881.			1882.			1883.			1884.		
	Covers.	Bush.	Lbs.	Covers.	Bush.	Lbs.	Covers.	Bush.	Lbs.	Covers.	Bush.	Lbs.
Western Coarse Salt Co	2,502	70	18	2,426	70	42	2,426	59	30	2,426	73	4
James M. Gere	952	66	12	899	70	11	899	59	16	899	73	50
Draper & Porter	430	69	31	428	70	38	428	58	3	428	71	15
Poole, Theo. F	223	55	11	294	62	55	294	53	51	294	65	42
Boyd, W. B	845	68	27	802	70	45	802	60	25	802	75	99
Turks Island Coarse Salt Co	1,053	72	11	1,072	66	41	1,072	55	36	1,072	70	22
Geddes Coarse Salt Co	2,388	70	49	2,312	71	5	2,312	59	12	2,312	76	50
Kirkpatrick, W. & D	1,335	79	52	1,289	77	27	1,289	67	41	1,289	84	6
Ely, Mrs. Foster	516	65	39	508	64	33	508	51	3	508	62	10
Paige, J. F	512	63	11	495	64	31	495	47	39	495	59	32
Union Coarse Salt Co	3,379	76	8	3,291	77	1	3,274	63	17	3,274	75	10
Cape Cod Coarse Salt Co	2,266	85	3	2,263	80	15	2,263	66	17	2,263	74	54
Stevens & Co., L	800	65	34	804	62	2	760	50	32	760	63	49
Syracuse Solar Salt Co	2,780	64	33	2,785	71	11	2,774	62	49	2,774	74	19
Franchot & Co., C	220	71	38	221	72	39	221	59	8	221	72	22
Empire Coarse Salt Co	1,700	69	5	1,672	63	44	1,672	53	53	1,672	66	21
Jaqueth & Co., S	1,118	53	..	1,084	54	14	1,084	43	7	1,084	62	..
Salina Coarse and Fine Salt Co	1,099	56	52	1,079	57	5	1,079	52	48	1,079	62	8
Gale, Thomas	4,956	74	7	4,966	77	5	4,966	69	18	4,966	84	22
Doyle, Garrett	889	63	24	841	69	28	841	57	7	841	71	20
Corkings, Philip	492	79	18	529	81	51	529	76	1	529	88	19
Highland Solar Salt Co	3,045	77	29	2,984	81	10	2,984	74	30	2,984	86	1
Young, Robert	600	57	1	579	61	32	579	54	38	579	65	3
White & Co., John	1,057	66	2	1,064	70	52	1,064	59	33	1,064	67	41
Peck, Duncan & Co	.....	..	..	.....	..	..	.....	..	..	.....	..	..
Clark & Alvord	3,200	76	32	3,200	75	16	3,200	60	53	3,200	69	64
Salt Springs Coarse Salt Co	3,800	75	33	3,800	77	65	3,800	61	..	3,800	73	..
Totals	42,157	71	51	41,687	72	44	41,615	61	47	41,615	74	30

Average per cover for 1881, 1882, 1884, 1885 on crop as delivered out.

Average per cover for 1886 on crop as estimated January 1, 1887.

H.— *The yield of solar salt per cover*—(Continued).

COMPANIES.	1885.			1886.			1887.		
	Covers.	Bush.	Lbs.	Covers.	Bush.	Lbs.	Covers.	Bush.	Lbs.
Western Coarse Salt Co	2,426	58	50	2,426	74	5	2,426	73	11
James M. Gere	899	55	21	899	76	27	899	69	17
Draper & Porter	428	58	22	428	76	9	428	74	32
Poole, Theo. F	294	55	14	294	86	16	294	89	08
Boyd, W. B	802	58	21	802	77	12	802	74	40
Turks Island Coarse Salt Co	1,072	58	27	1,072	72	3	1,072	75	32
Geddes Coarse Salt Co	2,312	61	8	2,312	74	39	2,312	74	31
Kirkpatrick, W. & D	1,289	66	46	1,289	82	48	1,289	84	35
Ely, Mrs. Foster	508	19	46	508	65	25	508	76	..
Paige, J. F	495	41	27	495	66	..	495	62	18
Union Coarse Salt Co	3,274	63	43	3,274	74	21	3,274	78	08
Cape Cod Coarse Salt Co	2,263	63	46	2,263	72	42	2,263	78	12
Stevens & Co., L	760	53	20	760	64	38	760	74	38
Syracuse Solar Salt Co	2,774	63	3	2,761	75	19	2,761	74	44
Franchot & Co., C	221	56	14	221	71	19	221	64	17
Empire Coarse Salt Co	1,672	55	37	1,672	68	5	1,672	64	51
Jaqueth & Co., S	1,084	51	1	1,084	66	50	1,084	60	30
Salina Coarse and Fine Salt Co	1,079	48	17	1,079	64	31	1,079	57	48
Gale, Thomas	4,966	75	55	4,966	99	12	4,966	95	01
Doyle, Garrett	841	57	44	841	83	5	841	76	14
Corkings, Philip	529	77	31	529	111	31	529	97	39
Highland Solar Salt Co	2,984	73	..	2,984	87	33	2,984	48	39
Young, Robert	579	52	52	579	85	1	579	65	27
White & Co., John	1,064	9	3	.....	...	..	.....	...	..
Peck, Duncan & Co	.....	..	..	400	110	7	400	107	09
Clark & Alvord	3,200	79	37	3,200	65	18	3,200	67	43
Salt Springs Coarse Salt Co	3,800	62	..	3,800	75	..	3,800	76	..
Totals	41,615	62	31	40,938	77	47	40,938	78	..

In addition to the above there was expended under chapter 589, of the Laws of 1886, appropriating the sum of $20,000 for laying iron conduit pipes, etc.; the further sum of $15,282\frac{66}{100}$ in laying iron conduit pipe, etc., from the Geddes pump-house to Gere's bridge, leaving an unexpended balance of said appropriation of $4,717\frac{34}{100}$, which has been returned to the treasury of the State.

This improvement was much needed and has proved entirely satisfactory.

WELLS.

There are on the Reservation five groups of wells: The "Syracuse," "De Wolf, "Gere," "Salina" and "Geddes" groups.

The larger of these, the "Syracuse group," is composed of fourteen wells, of which, owing to the lack of strength of brine, only nine were pumped continuously during the season, and two others at intervals as the demand for brine made it necessary.

The "Geddes" group consists of twelve, of which number nine are private wells, but all are pumped by the State; only nine were used during the past season; three of the private wells having failed.

The "De Wolf" group of six wells, including two private wells, pumped by the State, was used during the season, with the exception of one private well which gave out.

The Gere group is composed of six wells, all of which have been used.

The Salina or Marsh group comprises twelve wells, of which two failed; the remaining ten were all used.

All the above wells, except as stated, are in good condition and ready for use.

MACHINERY, ETC.

The machinery, tools and entire plant of the Reservation is all in condition to be placed in good running order by the opening of the season, with the means now on hand, with the exception of the boilers at the De Wolf and Syracuse groups.

The boiler at the De Wolf group has been in use for fifteen years and by reason of use and decay has become unsafe and unfit for use, and should be replaced.

At the Syracuse group there are five boilers, which have been in use since 1879, and are all in bad condition and unsafe, and should be replaced.

I respectfully recommend that the balance of the appropriation of 1886, amounting to $4,717.34, or so much thereof as may be necessary, be re-appropriated for the purpose of purchasing new boilers for these groups and placing the same in position. And in this connection I further recommend that in place of the five boilers at the Syracuse group there be placed two boilers of larger capacity, believing that the work will be as well done and that the saving in coal and expense of running make this change more economical and desirable.

Structures.

The various structures are all in good condition, and, with the means now at command, all necessary repairs will be completed and everything put in good working order by the opening of the season.

Supply.

Owing to the manufacture of salt with cheaper fuel in Michigan, and stronger brine in the Wyoming and Livingston district in this State, the market for fine salt produced on this Reservation has been curtailed, leading to a reduced production of 405,960 bushels during the past season, giving a reduction of revenue of $4,059.60.

Our manufacturers are now striving, by improved methods of manufacture to overcome the apparent advantages of other localities, and believe that with their experience and facilities for shipment that they will be able to restore their lost prestige in the fine salt trade.

In this connection I desire to say that I understand that manufacturers here are about to apply to the Legislature for an appropriation to be used for the digging of new wells, intended to increase the strength of brine. This is a step of the greatest importance, and I ask for their communication, when received, a favorable consideration at your hands, as the later wells sunk here have developed a stronger brine.

Conclusion.

In conclusion, I wish to call your attention to the fact that nearly all existing leases for fine salt manufacturing purposes expire during the coming year, and while I have the right under the existing statute to renew the same, I desire to submit a statement of existing facts before doing so.

There is now held by such leases, or claimed to be so held, a large amount of land, of greater or less value, but in the aggregate of great value, which is not needed or used for salt manufacturing purposes, and will never again be required for such uses. Applications are being constantly made to the Board of Land Commissioners for the purchase of these lands; the exact location, value and amount of such lands are not definitely known. The parties claiming these lands claim, and I believe have by reason of their past connection therewith certain equities in said premises, the amount of which it is difficult to determine under existing statutes.

If these lands could be definitely located, the equities of leaseholders determined, the lands withdrawn from the Reservation and the fee placed in the hands of parties desiring it, the business of the Reservation would not be injured, while the amount realized by their sale, and the increased taxable value of the property resulting from its improvement, would be of great advantage to the State.

I therefore respectfully recommend that such legislation be had as may be necessary to that end.

I respectfully refer to the annexed report of Dr. Englehardt, which contains much interesting information and will explain itself.

In my official report to the Comptroller at the commencement of the present fiscal year, I presented in detail the needs of the office for the ensuing year, amounting to the sum of $63,500.

All of which is respectfully submitted.

P. J. BRUMMELKAMP,

Superintendent.

REPORT OF THE CHEMIST.

SYRACUSE, N. Y., *December* 30, 1887.

To the Hon. P. J. BRUMMELKAMP, *Superintendent of the Onondaga Salt Springs:*

DEAR SIR.—In a former report, I have given the record of the material passed through in the sinking of the deep wells in Onondaga county, to ascertain if rock-salt could be found in the neighborhood of Syracuse, and from which it was evident that it could not be found here. Through the kindness of Mr. Crocker, of

Greigsville, Livingston county, I have come into possession of the record kept by him of the material passed through in sinking the shaft at Pifford by the returns of the Salt Company, which accompanies this report. The red shale (the geological formation north of the Erie canal in this city, in which the 2,000 feet State well and the 1,600 feet "Gale well" were sunk,) as is evident from this record, was first encountered at a depth of 877 feet; the overlaying material consisting of gypseous shales, the Helderberg and Hamilton formations. The total depth of the shaft is reported at 1,140 feet, the last 130 feet contain eighty-three feet of rock-salt. Two of the salt veins are respectively twenty-two and fifty-three feet thick, with some shales between. As far as I know, all the salt thus far mined, has been taken from the twenty-two foot vein. As a mineralogical curiosity, I may mention that a two-inch vein of reddish columnar salt is found above the two-foot vein, which is remarkably pure, yielding over ninety-nine per cent. of pure salt.

The sinking of a test well at Ithaca, Tompkins county, during last summer, has added another rock-salt locality in our State. The rock-salt bed, about fifty feet in thickness, was struck in this well at a depth of about 2,270 feet.

The salt bed underlaying our State, as far as now known, extends from west to east between 110 to 120 miles, and from north to south from forty to fifty miles. We have therefore over 4,000 square miles of salt of an average thickness of forty feet, an inexhaustible supply for centuries to come.

The results of the trials made at the new experiment block in the second ward in this city during the past summer have been very satisfactory, both in the quality of the salt made and the yield per ton of coal, and I am of opinion that if this process is carried on in a proper scale, whereby the expense for labor, etc., can be reduced very materially, and with sufficient care to insure an always uniform product, salt can be made at Syracuse, that will be inferior to none in the market, and a great deal cheaper than any now made at Syracuse.

I have appended to this report the usual tables of brine strength, which require no explanation.

Most respectfully.

F. E. ENGELHARDT, PH. D.,
Chemist.

MATERIAL PASSED THROUGH IN SINKING THE SHAFT AT PIFFORD, LIVINGSTON COUNTY, N. Y.

	Thickness of mater'l	Depth of shaft.
	Feet.	Feet
Encrinal limestone	8	8
Moscow shales	40	48
Dark shales	93	141
Limestone	8	149
Lower Helderberg (Ludlow shales)	216	365
Limestone	4	369
Marcellus shales	39	408
Corniferous limestone	2	410
Shales	1	411
Corniferous limestone	140	551
Onondaga limestone	1	552
Hydraulic limestone ("Waterline")	13	565
Sandstone	14	579
Gypsum	4	583
Hydraulic limestone	25	608
Gypsum	47	655
Magnesian limestone	63	718
Hydraulic limestone	14	732
Blue shales	25	757
Hydraulic limestone	10	767
Blue shales	12	779
Helderberg limestone	17	796
Limestone and sandstone	31	827
Hydraulic limestone	10	837
Limestone and cement	15	852
Hydraulic limestone	6	858
Blue shales	19	877
Red shales	12	889
Limestone	41	930
Red shales	5	935
Blue shales	12	447
Limestone	12	959
Salt shales	51	1,010
Rock-salt	2	1,012

Salometer strength of the brine of the wells belonging to the Syracuse groups in 1887.

MONTHS.	Well 1.	Well 2.	Well 3.	Well 4.	Well 5.	Well 6.	Well 7.	Well 8.	Well 9.	Well 10.	Well 11.
March	.....	.....	69.30	70.00	71.30	71.00	.....	70.04	70.00	70.00	.....
April	64.00	.....	66.03	71.76	70.00	71.00	52.00	70.84	68.08	69.00	70.05
May	62.50	.....	66.00	70.00	70.09	71.00	51.09	70.09	68.09	68.91	70.00
June	59.43	60.65	66.00	70.00	70.81	71.00	50.00	71.00	69.00	67.95	70.00
July	57.93	59.84	65.38	69.85	70.14	71.26	.....	70.56	67.55	66.53	67.58
August	.....	60.46	64.27	70.00	70.58	71.96	.....	70.42	65.27	63.34	68.67
September	.....	.....	63.71	71.00	70.08	70.80	.....	70.00	63.41	62.75	66.70
October	.....	.....	62.95	69.69	70.04	70.80	.....	69.13	.....	.....	65.05
November	.....	.....	63.43	68.54	70.00	70.00	.....	71.03	.....	.....	.....
Average	60.96	60.28	65.23	70.09	70.34	70.98	51.03	70.34	67.34	66.92	68.29

Salometer strength of the brine of the wells belonging to the Geddes group, in 1887.

MONTHS.	COMSTOCK WELLS.				STATE WELLS.		SALT-SPRING WELLS.	
	Well 2.	Well 3.	Well 4.	Well 5.	Well 1.	Well 2.	Well 1.	Well 2.
June	71.89	71.40	72.51	74.46	72.00	71.34	71.78	74.73
July	71.83	71.58	72.37	74.45	71.86	71.46	72.00	75.00
August	71.85	71.61	72.51	74.39	71.90	72.56	72.00	74.95
September	71.76	71.76	72.49	74.31	71.76	72.68	71.95	75.00
October	71.74	71.57	72.49	74.33	71.59	72.48	72.00	75.03
November	71.69	71.81	72.14	74.65	72.24	71.88	72.25	.....
Average	71.78	71.62	72.42	74.43	71.89	72.07	71.99	74.94

Salometer strength of the brine of the wells belonging to the DeWolf group in 1887.

MONTHS.	Well 1.	Well 2.	Well 3.	Well 4.
June	75.00	74.00	74.00	74.00
July	73.97	74.14	73.97	74.77
August	74.00	73.95	73.95	74.35
Average	74.32	74.01	73.97	74.37

Salometer strength of the brine of the wells belonging to the Gere group in 1887.

MONTHS.	Well 1.	Well 2.	Well 3.	Well 4.	Well 5.	Well 6.
May	78.98	78.10	78.85	78.10	77.88	78.15
June	78.74	77.98	77.93	77.87	78.20	77.45
July	78.41	77.87	77.87	77.86	77.83	77.64
August	78.08	77.71	78.03	77.69	77.89	77.56
September	78.38	77.73	78.11	77.75	78.05	77.59
October	78.20	77.99	78.20	77.95	78.16	77.51
November	78.01	77.81	77.84	77.87	77.82	77.37
Average	78.40	77.88	78.12	77.87	77.97	77.61

Salometer strength of the brine of the wells belonging to the Marsh group in 1887.

MONTHS.	Well 1.	Well 2.	Well 3.	Well 4.	Well 5.	Well 6.	Well 7.	Well 8.	Well 9.	Well 10.
May	77.98	74.95	74.82	75.69	.....	.....	.....	.....	.....	.....
June	77.00	71.05	69.81	73.48	76.74	.....	.....	.....	.....	.....
July	76.11	75.90	72.40	65.55	60.90	73.66	71.31	72.92	76.17	76.11
August	76.67	76.64	70.77	64.09	59.48	72.48	69.45	72.35	75.64	75.96
September	76.46	76.46	71.20	63.60	59.20	71.56	65.13	71.73	71.70	71.70
October	76.55	76.54	72.00	67.94	.....	73.32	.....	73.32	75.91	76.06
November	76.00	76.00	76.00	67.10	58.40	72.63	.....	72.56	76.26	76.26
Average	76.68	75.36	72.43	68.21	62.94	72.73	68.63	72.57	75.13	75.22

Strength of brine in the four districts for the season of 1887.

MONTHS OF 1887.	SYRACUSE.		SALINA.		LIVERPOOL.		GEDDES.	
	Fahrenheit, degrees.	Salometer, degrees.	Fahrenheit, degrees.	Salometer, degrees.	Fahrenheit, degrees.	Salometer, degrees.	Fahrenheit, degrees.	Salometer, degrees.
May	53.00	69.13	56.50	71.98	56.50	71.98	56.50	69.50
June	53.50	68.75	58.00	71.99	58.00	71.99	58.00	72.00
July	54.50	67.98	59.60	70.33	59.60	70.33	59.50	73.50
August	55.00	67.16	56.60	70.71	56.60	70.71	67.60	72.80
September	54.00	67.87	55.25	70.89	55.25	70.89	55.33	73.50
October	52.25	67.34	55.23	71.41	55.23	71.41	53.00	74.00
November	49.25	67.73	50.75	70.86	50.75	70.86	51.00	73.00
Average	53.07	67.99	56.00	71.17	56.00	71.17	55.85	72.61
At 60° Fahrenheit	.....	67.30	.....	70.77	.....	70.77	.....	72.20

Grand total at 60° Fahrenheit, 70.26 degrees of Salometer.

REPORT AND PROCEEDINGS

OF THE

NEW YORK BOUNDARY COMMISSION

For the Year 1887.

TRANSMITTED TO THE LEGISLATURE JANUARY 25, 1888

THE TROY PRESS COMPANY, PRINTERS.
1888.

STATE OF NEW YORK.

No. 35.

IN ASSEMBLY,

JANUARY 25, 1888.

FIRST REPORT

OF THE

COMMISSION APPOINTED TO LOCATE AND MARK OUT, BY STAKES AND BUOYS, THE TRUE BOUNDARY LINE BETWEEN NEW YORK AND NEW JERSEY, IN LANDS UNDER WATER IN RARITAN BAY.

NEW YORK BOUNDARY COMMISSION.

OFFICE OF THE COMMISSIONERS,
39 NASSAU STREET, NEW YORK.

To the HON. FREMONT COLE, *Speaker of the Assembly:*

SIR. — On behalf of the commissioners appointed to locate and mark out by stakes and buoys the true boundary line between New York and New Jersey, in lands under water in Raritan bay, and by their direction, I have the honor herewith to transmit to the Legislature a report of their proceedings, both in separate session and in joint conference with the commissioners appointed for a like purpose by the State of New Jersey, together with a description of the line agreed upon and a statement as to the number and location of the buoys set.

Very respectfully,

EDWARD P. DOYLE,
Secretary.

REPORT.

To the Legislature of the State of New York:

The commissioners appointed by the Governor, under authority of chapter 69, Laws of 1887, to locate and mark out the true boundary line between New York and New Jersey, in lands under water in Raritan bay, respectfully submit a report of their proceedings, together with a description of the line determined upon, and a copy of the agreement made with the commissioners appointed for a like purpose on the part of New Jersey.

The authority under which the commissioners have conducted this work is derived from the act above mentioned, which act is as follows:

Chapter 69.

AN ACT for the settlement of territorial disputes in regard to the lands under water in Raritan bay.

Passed March 15, 1887; three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. The Governor shall appoint three commissioners who shall have full power, on the part of the State of New York, to meet the commissioners appointed, or to be appointed, by the State of New Jersey, and with them locate and mark out, by proper monuments and buoys, the true boundary line between the two States in lands under water in Raritan bay.

§ 2. The said commissioners, within one year from the passage of this act, shall file with the Secretary of the State of New York a map showing such boundary line.

§ 3. The expenses of the said commissioners, not exceeding one thousand dollars, shall be paid by the treasurer upon the warrant of the comptroller, after first being approved by the Governor.

§ 4. This act shall take effect immediately.

STATE OF NEW YORK, }
OFFICE OF THE SECRETARY OF STATE. } *ss.:*

I have compared the preceding with the original law on file in this office, and do hereby certify that the same is a correct transcript therefrom and of the whole of said original law.

FREDERICK COOK,
Secretary of State.

Pursuant to the chapter above mentioned, his Excellency, Governor Hill, appointed Mayo W. Hazeltine and Robert Moore, of Richmond county, and Lieutenant G. C. Hanus, U. S. N., as the commissioners on the part of New York.

The commissioners on the part of New Jersey were appointed by his Excellency, Governor Green, under an act passed in 1886, the text of which is as follows:

Joint resolution authorizing the appointment of a commission to locate and mark out the boundary line between the State of New Jersey and the State of New York, in Raritan bay.

WHEREAS, Disputes are constantly arising between citizens of this State and citizens of the State of New York engaged in shell fisheries in Raritan bay, as to the boundary line between the two States, in land under water in Raritan bay; and,

WHEREAS, That by reason of the absence of any means to locate the boundary line, there exists an uncertainty about the location thereof between the State of New Jersey and the State of New York, as defined in the act entitled "An act for the settlement of the territorial limits and jurisdiction between the States of New Jersey and New York," passed the sixth day of February, one thousand eight hundred and thirty-three; now, therefore,

SECTION 1. *Be it Resolved*, by the Senate and General Assembly of the State of New Jersey, that the governor of this State be and he is hereby authorized to appoint three commissioners with power, on the part of the State, to meet any authorities of the State of New York, who may be duly authorized, and with them to locate and mark out by proper buoys the boundary line between the two States in land under water in Raritan bay; that the expenses of said commission shall be paid by the treasurer, on the warrant of the comptroller, after first being approved by the governor.

§ 2. That this resolution take effect immediately.

Before proceeding to give in detail the operations of the commissioners thus authorized and appointed, it may be well to state the causes that led to the enactment of the laws under which the commissions were created.

The great value of the lands under water in Raritan bay for the cultivation of oysters became apparent early in the present century. The long, shallow, land-locked bay, subject to the constant ebb and flow of ocean tides and fed by many fresh water streams, possessed every requisite necessary for the successful and profitable cultivation of every variety of shell-fish. The salt water was their natural element; the fresh water streams brought an abundance of animal

and vegetable life, necessary for their growth and development, and the hard, sandy bottom of the bay afforded a bed upon which they could be planted with security.

Beds of natural growth, where oysters grew in great abundance, were found by the first settlers, and for a long time these proved sufficient to satisfy the wants of the scanty population. But the increasing demand, resulting from the rapid growth of population in the interior, and the consequent danger of depletion and exhaustion of the natural beds from over fishing, rendered some method of artificial propagation imperative, and about 1810 oysters were planted and cultivated. At first all the lands under water in the bay were considered as common to residents of both States, and no attempt was made to divide them according to State lines. Only when the industry began to grow in importance, and the lands consequently to increase in value, did local jealousies arise and disputes between citizens of New York and citizens of New Jersey become common.

These disputes soon grew to be of a serious nature, and sometimes ended in bloodshed. Especially was this so after legislative enactments had been passed by each State making it a misdemeanor for citizens to take or cultivate oysters in the waters of the other State. No attempt, however, was made to locate or define the boundary line until 1834, when an agreement was made and ratified between the two States by which the boundary line was said to be "the middle of the bay to the main sea." This, though vague, was sufficiently definite for a long time. The rapidly increasing number of planters and the great demand for oyster lands soon led to the occupation, in the most valuable part of the bay, of every available piece of ground, and the indefinite nature of the description of the boundary line given in the agreement of 1834 became a source of constant dispute.

The agreement, it is true, stated that the boundary line should be the middle of the bay, and were both shores perfectly straight this would have been a line easily located, but where the shores were alternately coves and projecting points the question of determining a just, central boundary was one of great difficulty. Whether in dividing the bay the areas of coves should be taken into consideration, or whether lines should be drawn from headland to headland as base lines from which the area of the bay should be computed and divided, were the questions first to be settled before any satisfactory boundary line could be located and defined.

It was impossible for those directly interested and at work in the bay to arrive at any conclusion, as to where the boundary ought to be, that would be mutually agreeable; and petitions, numerously

signed, were frequently sent to the Legislatures of the two States by the oystermen, praying that some means be taken to establish such line, but nothing was done until 1886, when the law creating the present New Jersey commission was passed.

New York followed in 1887 with a like enactment, and this dispute of so long standing began now in a fair way to be finally settled.

PROCEEDINGS OF THE JOINT COMMISSION.

Minutes of the first meeting of the joint commission to locate the boundary line between New York and New Jersey, in lands under water in Raritan bay, held at the Astor House, New York city, April 29, 1887.

Present.—Professor George H. Cook, Robert C. Bacot and A. B. Stoney, on the part of New Jersey; and Robert Moore and Lieutenant G. C. Hanus, on the part of New York, Mr. Hazeltine, of New York, being absent.

Permanent organization was effected by the election of A. B. Stoney, chairman, and Edward P. Doyle, secretary.

Mr. Robert Moore then offered the following resolution, which was unanimously adopted:

Resolved, That Robert C. Bacot, of New Jersey, and Lieutenant G. C. Hanus, U. S. N., of New York, be appointed a committee to examine the records and collect and prepare the information, with the assistance of the secretary, necessary for the use of the commission, and that they be authorized to expend the necessary moneys for traveling and incidental expenses.

On motion of Robert Moore, three maps were ordered from the United States Coast and Goedetic's Survey, for the use of the commission.

On motion, Professor Cook and Lieutenant Hanus were appointed a committee to communicate with the light-house board, and request that the board furnish the commission with the necessary buoys.

On motion, the secretary was authorized to procure the stationery necessary for the use of the commission.

The secretary was directed to communicate with Governor Green, and procure from him a copy of the papers sent him by Colonel Rice, relative to the New York commission.

On motion, meeting adjourned to meet May 9, 1887, at one o'clock, at 47 Montgomery street, Jersey City, New Jersey.

EDWARD P. DOYLE,
Secretary Joint Commission, New York and New Jersey.

MAY 9, 1887.

Minutes of the second meeting of the joint commission to determine the boundary between New York and New Jersey, in lands under water in Raritan bay.

Present.— A. B. Stoney, of New Jersey, chairman; Robert C. Bacot and George H. Cook, of New Jersey; Lieutenant G. C. Hanus, U. S. N.; M. W. Hazeltine and Robert Moore, of New York.

Lieutenant Hanus reported, on behalf of the committee appointed to collect and prepare information necessary for the use of the commission, that the committee had visited Washington and had obtained a great deal of information, but had not yet finished its work, and desired to report progress and ask for additional time.

The request for additional time was granted and the committee continued.

Professor Cook, on behalf of the committee appointed to request the light-house board to lend the commission certain assistance, reported that the committee had called on the secretary of the board at Washington, and had found him adverse to granting the request, but the committee believed that the request would be ultimately granted. He desired to report progress and ask for additional time.

The request was granted and the committee continued.

After some discussion the commission then adjourned to meet Monday, May 16, 1887, at twelve o'clock M., at the Astor House, New York.

EDWARD P. DOYLE,
Secretary.

MAY 16, 1887.

Minutes of the third meeting of the joint boundary commission to locate the true boundary line between New York and New Jersey, in lands under water in Raritan bay.

Meeting called to order by Prof. G. H. Cook in the absence of Mr. Stoney.

Present.—Prof. George H. Cook and Robert C. Bacot, on the part of New Jersey; Robert Moore, M. W. Hazeltine and Lieutenant G. C. Hanus, U. S. N., on the part of New York.

In the absence of Mr. Doyle, Robert Moore acted as secretary. No business was transacted, and the meeting adjourned, subject to the call of either of the chairmen of committees.

EDWARD P. DOYLE,
Secretary.

MAY 26, 1887.

Minutes of the fourth meeting of the joint commission to locate the true boundary line in lands under water in Raritan bay.

Meeting called to order by Prof. George H. Cook in the absence of Mr. Stoney.

Present.—George H. Cook and Robert C. Bacot, on the part of New Jersey, and Robert Moore, M. W. Hazeltine and Lieutenant G. C. Hanus, on the part of New York.

Minutes of the last meeting read and approved.

Lieutenant G. C. Hanus, from the committee appointed to collect and prepare the information necessary for the use of the commission, made the following report:

MAY 26, 1887.

Joint Boundary Commission, New York and New Jersey.

GENTLEMEN—Having been appointed by you as a committee to collect and prepare information necessary for the use of the commission, we have the honor to report that we have made a very extensive search for a precedent which might be of use in this case. We have visited the libraries in New York city, consulted a great number of authorities and made a personal investigation among the archives of the State departments at Washington, Albany and Trenton. Several hundred books, pamphlets and maps bearing on boundary settlements were examined by your committee. It will be seen from the following extracts that this commission will have to establish a very important precedent, *i. e.*, they will have to define what is meant by the middle of an arm of the sea where (in this case) the shores are not parallel, and where the value of land under water has to be taken into consideration.

The committee have made such a thorough investigation that they feel justified in reporting to the joint commission that the point as to what constitutes the middle has never before been settled. The following are a few of the extracts made by your committee, and may be of some slight use in the settlement of our boundary. (American Interstate Law [David Rorer], Iowa, pp. 334, 335).

TIDE-WATERS.

11. The shores of any ground under the navigable waters belong to the States, not by grant from the general government, but because they never were parted with. * * * But this ownership, or right of the several States, is subject to the national government in reference to a regulation of commerce.

This paragraph is quoted because it shows that in defining our boundary line we must confine ourselves to the use of buoys. Monuments would be obstructions to navigation.

Paragraph 111 of the above work says: "When two States have co-terminous boundaries on such water, each takes jurisdiction, and counties of such States expressed to be bounded by such waters, will be held to extend such boundaries in the center of the river of water, although in the law creating them they may be said to extend to low-water mark. * * * Each State and its citizens has the exclusive right of fishery in its own internal waters, and may prevent the taking thereof by citizens of other States." On page 337, in speaking of rivers, the author says: "The actual territorial boundary of each State is the main channel of the river." It will be noted that in the case of other waters, the vague term "center" is used. (Gould on Waters), Section 4. By law of England, the crown has the right of property in the arms of inlets of the sea, within the realm. * * * This right includes the bed of all tide-waters, which are or may be within the counties. * * * The territorial jurisdiction of a State now extends seaward three geographical miles * * * This external limit of jurisdiction is determined by measuring seaward from a straight line drawn from one enclosing headland to another. (New York R. S., 3d ed., '78, '79.) Whenever two counties are separated from each other by a river or creek, the middle of the channel is the dividing line. (Court of Appeals [Joel Tiffany], New York and Connecticut), (speaking of the boundary.) So far as the two States are co-terminous, it extends to the middle of the Sound, if not to a line running directly from Fisher's Island to Lyon's Point. (United States Digest, vol. 3, [New Hampshire] p. 146). Where two towns are situated on opposite sides of a river, and both are bounded on the river, the line between them is the center of the river, measuring from bank to bank. (Revised Statutes of Maine, 1883.) This work is referred to because it shows how boundaries have been run in that State where the shores of the waters are not parallel, as is the case in Raritan Bay. They generally ran from fixed points on compass courses to other points. (New Jersey Digest of Reports 1790 to 1876, part 1, p. 104.) The Supreme Court of the United States has exclusive jurisdiction between States, except where there has been a compact. Whether a particular place is within the boundaries of a State is a question of fact for a jury. (Angell on Tide-Waters.) This volume, while it does not bear directly on our case, contains much useful information on the subject of headlands, to the right of fishing, oysters, etc. (In Error to the Circuit Court of U. S. District of New

Jersey.) Defendant in error, the lessee, William C. H. Wardell, instituted, April term, 1835, an action for ejectment against M. Mazlin and others, for recovery of certain land under water in Raritan bay, in the state of New Jersey. The jury found the premises in dispute are situated beneath the waters of the Raritan bay and river, where the tide ebbs and flows. That the plaintiffs in the ejectment claimed title under regular conveyance, etc., etc., and in short they owned everything under original charter granted to the Duke of York (Howard's Reports, vol. 7, p. 660. Missouri constitution). "From a point in the middle of the Kansas river, running due north, along a meridian line to the intersection of the parallel of latitude," etc., etc. This paragraph is quoted because the boundary is defined by compass course instead of following the middle of the river which it is so difficult to define (Howard's Reports, vol 4. Rhode Island v. Massachusetts, 591. 592). For the security of rights, whether of States or individuals, long possession, under a claim of title is protected. And there is no controversy in which this great principle may be invoked with greater justice and propriety, than in a case of disputed boundary (Supreme court). (The boundary of Connecticut [Bowen]. Disputes lasting 250 years.) In the map in this pamphlet showing the boundary between New York and Connecticut, the boundary line is straight and as near the center of the sound as may be until near Fisher's island sound, when changes of course are made but always in straight lines, the boundary line is never a curve. North American boundary A, page 41, house of representatives, Maine, a line to be drawn along the middle of the river St. Croix. In connection with this expression there is this foot note on page 27:

The term "concipictus" appears to point to the general practice of communicating between the St. Croix and Quebec, by way of the rivers, as if it were said the practice hitherto has been to go circuitously by the rivers, but the true boundary is to be conceived as a straight line (The Norway v Jensen, 52 Illinois Reports, 373–380).

In Illinois the lines of counties bordering on Lake Michigan, have no portion of the waters of the lake assigned to them, yet the territorial limits of the State extend to the centre line of said lake.

We also recommend to the commission the following works:

Tuler's Law of Boundaries, Vattel Law of Nations, Kent's Commentaries, and the case of the People v. the Central railroad company of New Jersey (42 N. Y. Reports, 283–316).

The committee required a longer time to complete its researches than the extracts from the works quoted might warrant, but we respectfully call attention to the fact that from the greater number of

authorities consulted, no extracts were made, since nothing was found in them which in any way bore on the work of this commission, and even if you were inclined to grant your committee further time they are now fully convinced that they would be unable to find anything further bearing on this case.

Very respectfully,

R. C. BACOT.
G. C. HANUS,
Lieutenant U. S. Navy.

On motion of Robert Moore the report of the committee was received and placed on file.

On motion of Robert Moore it was unanimously

Resolved, That the question as to how the vote of the commissions shall be counted, be referred to the separate commissions to report at the next meeting.

On motion of M. W. Hazeltine, the chair was directed to appoint a committee of two, one from each State, to compute the areas of the waters of both States, included in the treaty of 1834, and also to detrmine the headlands to be taken as forming points on each shore, from which calculation should be made of areas of coves.

Lieutenant G. C. Hanus, U. S. N., of New York, and Robert C. Bacot, were appointed such committee.

Bill of the United States coast and geodetic survey, for $42.86, for a projection of Raritan bay, was ordered paid.

Lieutenant G. C. Hanus, from the committee appointed to confer with the light-house board, in relation to procuring buoys, etc., free of charge, reported progress and asked to be continued, which request was granted.

The commission then adjourned to meet at the call of either of the chairman of committees.

EDWARD P. DOYLE,
Secretary.

JULY 11th, 1887.

Minutes of Fifth Meeting.

Present.— A. B. Stoney, on the part of New Jersey, and Lieutenant G. C. Hanus, U. S. N., on the part of New York.

There not being a quorum present, adjourned to meet at call of secretary.

EDWARD P. DOYLE,
Secretary.

Sixth meeting of the joint boundary commission, held Wednesday, August 17th, at 1 P. M.

Present.—M. W. Hazeltine, Robert Moore and Lieutenant G. C. Hanus, on the part of New York, and George H. Cook, Robert C. Bacot and A. B. Stoney, on the part of New Jersey.

Meeting called to order by Chairman Stoney, and minutes of last meeting read and approved.

Committee appointed to ascertain area of land under water in Raritan bay and to determine the headlands to be used as primary points in locating the boundary, reported disagreement and presented two maps, one prepared by Lieutenant Hanus, and the other by Mr. Bacot.

A long discussion followed, but no action was taken on the report.

On motion of Mr. Hazeltine Captain Hanus and Professor George H. Cook were appointed a committee and authorized to visit Washington and endeavor to ascertain what were the headlands forming the entrance to Raritan bay.

On motion of Mr. Hazeltine it was carried that in the event of but two members of the commission from one State being present they should be entitled to cast the vote of the State.

Moved by Mr. Hazeltine, and carried, that four members of the joint commission shall constitute a quorum, provided that the four shall be present, and at least two members from each state.

On motion meeting adjourned to meet Saturday, August 27th, 1887, at 1 P. M.

EDWARD P. DOYLE,
Secretary.

Seventh meeting of the joint boundary commission, held Saturday, August 27th, at 1 P. M.

Present—Geo. H. Cook, A. B. Stoney, and R. C. Bacot, on the part of New Jersey; and Robert Moore and Lieut. G. C. Hanus, U. S. N., on the part of New York.

Meeting called to order by Chairman Stoney, and minutes of last meeting amended and approved.

In behalf of the special committee appointed to visit Washington, and endeavor to ascertain the headlands forming the entrance to Raritan bay, Prof. Geo. H. Cook, of New Jersey, reported that the committee had visited Washington, and called at the office of the Secretary of State, but could get no information that would tend to settle the questions in dispute.

On motion of Robert Moore, the report was received and the committee continued.

On motion of Robert Moore, it was carried, that when the commission adjourns it adjourn to meet at Perth Amboy, N. J., on Tuesday, September 6, 1887, at 9 A. M., for the purpose of taking a steamer and visiting Raritan bay.

On motion of Lieutenant Hanus, the commission adjourned.

EDWARD P. DOYLE,
Secretary.

Eighth meeting of the joint boundary commission, on board the tug M. F. Cahill, Tuesday, September 6, 1887.

After a trip through Raritan bay, during which a number of observations were taken by Captain Hanus, and much valuable information obtained, the commissioners met in the cabin of the tug.

The commissioners present were — Lieutenant G. C. Hanus, U. S. N., and Robert Moore, on the part of New York; and A. B. Stoney, Robert C. Bacot and George H. Cook, on the part of New Jersey.

Minutes of last meeting read and approved.

On motion, Lieutenant G. C. Hanus and Robert C. Bacot were appointed a committee to locate and designate the point where the break in the boundary line between Great Beds light and Romer beacon should lie, it having been informally agreed upon by the commissioners that the line from Great Beds to Romer beacon should have but one turning point.

On motion, meeting adjourned subject to call of chairman of the committee.

EDWARD P. DOYLE,
Secretary.

Ninth meeting of the joint boundary commission, held Wednesday, September 21, at 47 Montgomery street, Jersey City, N. J.

Present.— Robert C. Bacot and George H. Cook, on the part of New Jersey; and Robert Moore and Lieut. G. C. Hanus, U. S. N., on the part of New York.

In the absence of A. B. Stoney, the meeting was called to order by Robert Moore, and on motion, Prof George H. Cook was made Chairman *pro tem.*

The minutes of the previous meeting were read and approved.

The committee appointed to locate the point at which the only break in the boundary line should occur, reported that they had agreed upon a point at the intersection of a line drawn from Morgan No. 2 point, U. S. Coast and Geodetic Survey, to the Romer Stone beacon, and a line drawn from Great Beds light-house, to Wilson's beacon in Monmouth county.

On motion, the report of the committee was adopted

After a long discussion, the following described line was then unanimously agreed upon as the boundary line between the two States, in lands under water in Raritan bay.

First. From Great Beds light-house in Raritan bay north twenty degrees sixteen minutes west, true, to a point in the middle of the waters of Arthur kill, or Staten Island sound, equidistant between the southwesterly corner of the dwelling house of David C. Butler at Wards Point on Staten Island, in the State of New York, and the southeasterly corner of the brick building on the lands of Cortlandt L. Parker at the intersection of the westerly line of Water street, with the northerly line of Lewis street, in Perth Amboy, in the State of New Jersey.

Second. From Great Beds light-house, south sixty-four degrees and twenty-one minutes east, true, (S. 64° 22′ E.) in line with the center of Waackkaack or Wilson's beacon in Monmouth county, New Jersey, to a point at the intersection of said line with a line connecting Morgan No. 2 Triangulation point, U. S. Coast and Geodetic Survey in Middlesex county, New Jersey, with the granite and iron beacon, marked on the accompanying maps as Romer Stone beacon, situated on the Dry Romer Shoal, and thence on a line bearing north seventy-seven degrees and nine minutes east, true, (N. 77° 9′ E.), connecting Morgan No. 2, Triangulation point, U. S. Coast and Geodetic Survey, in Middlesex county, New Jersey, with said Romer Stone beacon (the line passing through said beacon and continuing in the same direction) to a point at its intersection with a line drawn between the Hook beacon on Sandy Hook, New Jersey, and the Triangulation point, of the U. S. Geodetic Survey, known as the Oriental hotel on Coney Island, New York, then southerly at right angles with the last mentioned line to the main sea.

Third. The monumental marks by which said boundary line shall be hereafter known and recognized, are hereby declared to be as follows:

1st. The "Great Beds Light-house."

2d. A permanent monument marked "State Boundary Line, New York and New Jersey," and to be placed at the intersection of the

line drawn from the "Great Beds Light-house" to "Waackaack or Wilsons' Beacon," Monmouth county, New Jersey, and the line drawn from "Morgan No. 2" Triangulation Point, United States Coast and Geodetic Survey in Middlesex county, New Jersey, to the "Romer Stone Beacon."

3d. Bright buoys or spindles to be marked like the permanent monument above mentioned and placed at suitable intervening points along the line from the said permanent monument to the "Romer Stone Beacon."

4th. The "Romer Stone Beacon."

Fourth. The maps accompanying and filed with this agreement, showing the location of the above described boundary line between the State of New York and the State of New Jersey in Raritan Bay to the main sea, and of the monumental marks by which it is marked and to be marked duly authenticated and attested by the signatures of the said commissioners, and placed on file in the offices of the secretaries of state of the respective States, shall constitute the permanent and authentic records of said boundary line, and are hereby adopted by the parties hereto, and made part of this agreement.

On motion, the secretary was directed to endeavor to arrange a meeting between Governor Hill, of New York, and Governor Green, of New Jersey.

On motion, the committee on buoys were requested to visit Commodore Benham and ascertain what could be arranged with the light-house department as to procuring buoys and setting them.

On motion, meeting adjourned subject to call of the Committee on Boundary Lines.

EDWARD P. DOYLE,
Secretary.

Approved after amendment.

Minutes of tenth meeting of the joint boundary commission, New York and New Jersey, held October 12, 1887, *at* 39 *Nassau Street, New York.*

Present—George H. Cook, Robert C. Bacot and A. B. Stoney, on the part of New Jersey; and Robert Moore, M. W. Hazeltine and Lieut. G. C. Hanus, U. S. N., on the part of New York.

The meeting was called to order by the chairman, and the minutes of the previous meeting read and approved.

The secretary then reported that he had visited Albany and spoken to the Governor as directed, and that he (the Governor), while unable at present to help the commission, was favorably impressed with its

work and would render what he could in the future. On motion, the report of the secretary was accepted.

Lieutenant Hanus, from the committee on buoys, etc., reported that the Light-house Board of the United States had agreed, in a letter which he read to the commission, to sell the buoys needed to the commission at cost, and to loan a "tender" to place them. He also reported a plan for a permanent monument, to be erected at the turning point in the boundary line; and that the committee had interviewed Governor Green, who agreed to credit the bills for the expense necessary for the purchase of buoys and the erection of monument.

On motion of Robert Moore, the report of the committee was accepted with the thanks of the commission, and the committee continued.

On motion of M. W. Hazeltine, it was unanimously

Resolved, That Robert C. Bacot and Lieut. G. C. Hanus be given full authority on behalf of the commission to place the eight buoys on the line agreed upon at such points as shall, in their judgment, seem proper.

On motion of George H. Cook, it was unanimously

Resolved, That the same committee (Messrs. Hanus and Bacot) be given full authority on behalf of the commission to build a permanent monument at the point agreed upon in boundary agreement, upon a plan not different as to its general character from the one submitted to the commission by the committee on buoys, at a cost not to exceed four thousand dollars ($4,000), one-half of which sum should be paid by New Jersey and the other half by New York.

On motion of M. W. Hazeltine, it was unanimously

Resolved, That the same committee (Messrs. Hanus and Bacot) be given full authority on behalf of the commission to arrange for the purchase of eight buoys, at a cost not to exceed four thousand dollars ($4,000) in all, one-half of which sum should be paid by New York and one-half by New Jersey.

On motion of M. W. Hazeltine, it was carried that the commissioners now proceed to formally sign the agreement in duplicate, setting forth the boundary line as determined upon at the last meeting of the commission.

After the agreement had been signed, on motion of George H. Cook, it was carried that the compensation of the secretary for his services to the joint commission should be five hundred dollars ($500), half of which sum should be paid by New Jersey and half by New York.

On motion, meeting adjourned, subject to the call of the committee on purchase of buoys, etc.

EDWARD P. DOYLE,
Secretary.

Minutes of eleventh meeting, joint boundary commission, held Monday, October 31, 1887, *at* 47 *Montgomery street, Jersey Ciiy, New Jersey.*

Present.—Robert C. Bacot and George H. Cook, on the part of New Jersey; Robert Moore and Lieutenant G. C. Hanus, on the part of New York.

On motion of Robert Moore, G. H. Cook was elected chairman *pro tem.*

Minutes of last meeting were then read and approved.

Lieutenant Hanus informed the commission that he had received a letter from the Acting Secretary of the Navy, informing him that his services were needed by the department, and that he must state when he would rejoin his ship. In reply to this letter he had given Monday, November 7, 1887, as the date required. In view of this he asked that some one be substituted in his stead on the committee on buoys, etc.

On motion, Robert Moore was appointed such substitute, to act in the event Lieutenant Hanus should be obliged to leave the commission.

Mr. Hanus, from the committee on buoys, reported that bids had been received from four parties for building the permanent monument, but that all bids were in excess of the amount allowed for that purpose by resolution of the joint commission.

On motion of Robert Moore, the resolution fixing the amount allowed for the permanent monument at $4,000, was reconsidered, the resolution amended making the amount $6,000, and the amended resolution adopted.

On motion, the commission directed the committee to use iron for casing the permanent monument.

The committee were authorized to advertise for bids if necessary.

On motion, meeting adjourned subject to the call of the chair.

EDWARD P. DOYLE,
Secretary.

Minutes of twelfth meeting, New York and New Jersey boundary commission, held at 47 Montgomery street, Jersey City, N. J., November 30, 1887.

Present — Robert C. Bacot, George H. Cook and A. B. Stoney, on the part of New Jersey; Robert Moore and Lieut. G. C. Hanus, on the part of New York.

Minutes of last meeting read and approved.

Prof. G. H. Cook reported that application was made by the commission immediately after the meeting of October 31, to the Secretary of the Navy for additional leave of absence for Lieut. Hanus, and that Secretary Whitney had kindly granted further leave until December 4, 1887.

Capt. Hanus, from the committee on buoys, reported as follows:

GENTLEMEN. — I have the honor to report that the position of the permanent beacon has been properly located on the ground. Mr. W. G. Ford, Jr., assisted me in its location. It is marked by five stakes; the center one having a red flag nailed to it. As this position is very important, I subsequently planted a second class wooden spar buoy on this spot, with the aid of the light-house tender. It is not likely that the ice will carry this buoy away, as it is well moored to a heavy stone anchor. The following horizontal angles determine its position, which is shown on the regular maps of the commission:

Wilson beacon to Prince's Bay light-house — 99° 41′ 30″.

Princes Bay light-house to Episcopal spire (Perth Amboy) — 64° 9′ 0″.

Episcopal spire (Perth Amboy) to Front. (Shown on map—83° 14′ 0″

Front to Wilson Beacon — 112° 55′ 30″.

Through the kindness of the Light-house Board I was enabled to plant all the buoys without much difficulty, as the expense would have been greatly increased had I attempted to do this work alone, owing to drift due to tide or wind. I was fortunate enough to secure the services of one of my former assistants, Ensign G. R. French, U. S. N., and having thus two observers, we had no difficulty in dropping the buoys in the desired place on the boundary line. The buoy nearest the monument was placed in the position marked on the map. It is a second class wooden buoy. The following horizontal angles determine its position:

Cupola to Dental chimney (both shown on map) — 113° 37′.

Dental chimney to Episcopal spire (Perth Amboy) — 71° 03′.

The third buoy planted was an iron spar buoy of the third class; its position is shown on the map. The following angles determine its position:

Dental chimney to Pinces Bay light-house — 22° 55′.

Princes Bay light-house to Episcopal spire. (Perth Amboy).—25° 34′.

Great Beds to White spire. (Shown on map).— 72° 16′.

The fourth buoy planted was an iron spar buoy of the third class. Its position is determined by the following horizontal angles:

Great Beds light-house to Bayside beacon — 124° 34′.

Bayside beacon to Sandy Hook light-house — 42° 5′.

The fifth buoy planted was an iron spar buoy of the third class. Its position is determined by the following horizontal angles:

Elm Tree beacon to Princes Bay light-house — 96° 6′.

Princes Bay light-house to Brown spire. (Shown on map).— 62° 22′.

The sixth buoy planted was an iron spar buoy of the third class. Its position is determined by the following horizontal angles:

Elm Tree beacon to Princes Bay light-house — 92° 6′.

Princes Bay light-house to Brown spire — 50° 49′.

All the above buoys are painted white above the line of flotation, and green under water.

The seventh buoy is a wooden can and can be replaced by an iron spar. Its position is determined by the following horozontal angles:

Elm Tree beacon to Princes Bay light-house — 70° 32′.

Princes Bay light-house to Brown spire — 39° 37′.

As all the above buoys are on the boundary line, it is an easy matter now at any time to increase the number by getting the buoys on range and dropping others. They would be on the boundary line and their position on that line could be determined near enough for practical purposes by compass bearings, unless it became necessary to determine the position exactly; in which case it would be necessary to employ hydrographic engineers.

On motion of Robert Moore, the report was approved and ordered to be spread on the minutes.

Captain Hanus also read a letter from the light-house board, loaning the committee on buoys the light-house tender of the third light-house district, for the use of the commission in planting buoys.

On motion of Robert Moore, the committee on buoys was instructed to extend the thanks of the commission to the light-house board for the use of the tender and buoys, and ascertain how the buoys could be replaced.

On motion of George H. Cook, $100 each was voted W. G. Ford, Jr., and Ensign G. R. French, U. S. N., for assistance given Lieutenant Hanus in determining the boundary line.

On motion of Robert C. Bacot, 2,000 lithograph copies of a map of Raritan bay, showing the boundary line, was ordered; 1,000 copies for each State.

On motion of Lieut. G. C. Hanus, the secretary was directed to write to the Superintendent of the Coast Survey, extending to him the thanks of the commission for his kindness and courtesy.

On motion of Robert Moore, meeting adjourned, subject to call of the chair.

EDWARD P. DOYLE,
Secretary.

The agreement, as finally agreed upon by the commissioners, is as follows:

An agreement made the twelfth day of October, in the year 1887, between Mayo W. Hazeltine, Robert Moore and Lieut. G. C. Hanus, U. S. N., commissioners on the part of the State of New York, and George H. Cook, Robert C. Bacot and A. B. Stoney, commissioners on the part of the State of New Jersey.

Whereas, By chapter 69 of the Laws of the State of New York, for the year 1887, the Governor was authorized to appoint three commissioners on the part of the State of New York, with full power to meet with the commissioners duly authorized on the part of the State of New Jersey, and with them to locate and mark out by proper monuments and buoys the true boundary line between the two States in lands under water in Raritan bay; and

Whereas, The said Mayo W. Hazeltine, Robert Moore and Lieut. G. C. Hanus, U. S. N., were duly appointed commissioners on the part of the State of New York, for the purposes mentioned in the said act; and

Whereas, By an act of the Legislature of the State of New Jersey, passed April 20, 1886, entitled "A joint resolution authorizing the appointment of a commission to locate and mark out the boundary line between the State of New Jersey and the State of New York in Raritan bay," the Governor of the State of New Jersey was authorized to appoint three commissioners with power, on the part of the State, to meet any authorities duly authorized on the part of the State of New York, and with them to locate by proper buoys the boundary line between the two States of lands under water in Raritan bay; and

Whereas, The said George H. Cook, Robert C. Bacot and A. B. Stoney were duly appointed commissioners for the purpose of said act, and

Whereas, The said commissioners acting for and on behalf of their respective States have entered upon the performance of the duties

imposed upon them by said act, and have in pursuance of the authority of them, severally given as aforesaid, agreed and hereby do agree upon boundary line between the two States, in lands under water in Raritan Bay, and locate the same as follows:

First. From the "Great Beds Light-house" in Raritan Bay north 20 degrees (twenty) sixteen minutes west, true, to a point in the middle of the waters of Arthur Kill or Staten Island sound, equidistant between the southwesterly corner of the dwelling-house of David C. Butler at Ward's Point on Staten Island, in the State of New York, and the southeasterly corner of the brick building on the lands of Cortland L. Parker, at the intersection of the westerly line of Water street, with the northerly line of Lewis street, in Perth Amboy, in the State of New Jersey.

Second. From "Great Beds Light-house," south sixty-four degrees and twenty-one minutes east, true (S. 64° 21′ E.), in line with the centre of Waackaack or Wilson's Beacon in Monmouth county, New Jersey, to a point at the intersection of said line with a line connecting "Morgan No. 2" Triangulation Point, United States Coast and Geodetic Survey in Middlesex county, New Jersey, with the "Granite and Iron Beacon," marked on the accompanying maps as "Romer Stone Beacon," situated on the "Dry Romer Shoal," and thence on a line bearing north seventy-seven degrees nine minutes east, true, (N. 77° 9′ E.), connecting "Morgan No. 2," Triangulation Point, United States coast and Geodetic Survey in Middlesex county, New Jersey, with said Romer Stone Beacon (the line passing through said Beacon and continuing in the same direction), to a point at its intersection with a line drawn between the "Hook Beacon" on Sandy Hook, New Jersey, and the Triangulation Point of the United States Geodetic Survey, known as the Oriental Hotel on Coney Island, New York; then southeasterly at right angles with the last mentioned line to the main sea.

Third. The monumental marks by which said boundary line shall be hereafter known and recognized, are hereby declared to be as follows:

1st. The "Great Beds Light-house."

2d. A permanent monument marked "State Boundary Line, New York and New Jersey," and to be placed at the intersection of the line drawn from the "Great Beds Light-house" to Waackaack, or "Wilson's Beacon" Monmouth county, New Jersey, and the line drawn from "Morgan No. 2" Triangulation Point, United States Coast and Geodetic Survey, in Middlesex county, New Jersey, to "Romer Stone Beacon."

3d. Eight buoys or spindles to be marked like the permanent

monument above mentioned and placed at suitable intervening points along the line from the said permanent monument to the "Romer Stone Beacon."

4th. The "Romer Stone Beacon."

Fourth. The maps accompanying and filed with this agreement, showing the location of the above described boundary line between the State of New York and the State of New Jersey, in Raritan Bay, to the main sea, and of the monumental marks by which it is marked and to be marked, duly authenticated and attested by the signatures of the said commissioners, and placed on file in the offices of the secretaries of state of the respective States, shall constitute the permanent and authentic records of said boundary line, and are hereby adopted by the parties hereto, and made part of this agreement.

In witness whereof, the said commissioners have hereto set their hands and seals in duplicate, this twelfth day of October, in the year of our Lord, 1887.

M. W. HAZELTINE, [L. S.]
ROBERT MOORE, [L. S.]
G. C. HANUS,
Lieutenant U. S. N., [L. S.]
GEORGE H. COOK, [L. S.]
ROBERT C. BACOT, [L. S.]
A. B. STONEY, [L. S.]

Certified to:

EDWARD P. DOYLE,
Secretary Joint Commission.

In conclusion, the commissioners desire to state their great satisfaction at the completion of their labors as far as the location of the line is concerned.

For a long time the joint commission found the work assigned them beset with many difficulties. Strange to say, no established precedent was to be found upon which the commissioners could base their action for a satisfactory settlement of the questions involved. The committee appointed for that purpose searched carefully, but vainly, every recognized authority on international law without finding a parallel case to the one at issue.

Even the exact point or line at which the bay began and the main sea ended was also a disputed question and one of great difficulty to determine. Although the committee having this matter in charge visited the state department at Washington to ascertain if possible

the true limits of the bay, they obtained no definite information, and this question, like all at issue, had to be decided by the commissioners without the aid of precedent.

The settlement of every boundary line seemed invariably to be a compromise based on no definite principle of law.

Learned discourses on international jurisprudence had no weight in the proceedings of the commission, and the questions in hand were almost exclusively settled by consideration of the commercial interests involved.

No established precedent being found, the commissioners proceeded with their work, believing that whatever was a fair and equitable division of the entire area of the bay would be a boundary line most satisfactory to the citizens of the States represented. A straight line between fixed and permanent points was, of course, to be desired, and whenever a concession by one State to the other became necessary by reason of the undulating character of the shores of the bay, a corresponding concession was always made.

This very difficult and delicate work was done entirely by members of the commission, or rather by a sub-committee of the joint commission, consisting of one from each state — Lieutenant Hanus and Mr. Bacot — both practical engineers.

The straight line finally adopted was, as has been stated, necessarily a compromise and its accurate location involved an immense amount of labor.

Many lines were proposed and rejected before the ultimate agreement, and each change necessitated new calculations of the areas involved.

Nearly the entire summer was spent by the engineers at this work and numerous maps were prepared.

The final result, however, was the unanimous agreement upon a boundary line just in every particular and nearly as possible correct in its division of the lands under water in Raritan bay.

The work remaining to be done by the commission is comparatively unimportant. In order to mark the line permanently and in such a manner that it could be easily determined by all interested, the commission decided to build one permanent monument and set eight buoys or spindles mrrked "New York and New Jersey State boundary line."

The small appropriation made by the New York Legislature has prevented the completion of this part of the work, although through the kindness of the United States light-house board buoys to be paid

for by the State of New York have been loaned the commission and are now actually in position.

The commissioners recommend an appropriation be made by the Legislature of $6,000, or as much thereof as may be necessary, to be used as follows:

One-half the cost of permanent monument	$3,000
One-half the cost of buoys, setting, etc	1,500
One-half the cost of supervision of work of building monument and additional surveying and incidentals	1,500
In all	$6,000

The reports of the engineers, the correspondence of the commission and the table of expenditures will be found in the Appendix.

ROBERT MOORE,
G. C. HANUS,
Lieut. U. S. Navy,
M. W. HAZELTINE.

APPENDIX.

[CORRESPONDENCE.]

STATE OF NEW YORK:

OFFICE OF THE SECRETARY OF STATE,
ALBANY, *November* 30, 1887.

DEAR SIR.—I have this day received "Map of the boundary line between the States of New York and New Jersey in lands under water in Raritan bay," agreed upon by the commissioners appointed by the Governors of their respective States, to locate and mark out by proper monuments and buoys said boundary line; and have this day filed the same in the office of the Secretary of State of New York, in accordance with the provisions of section two, chapter sixty-nine, Laws of 1887.

Very respectfully,

FREDERICK COOK,
Secretary of State.

Hon. E. P. DOYLE, *Secretary of Joint Boundary Commission, New York.*

TREASURY DEPARTMENT, OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, *November* 8, 1887.

Hon. A. B. STONEY, *Chairman of the Joint Boundary Commission, New York and New Jersey, No.* 39 *Nassau street, New York city*:

SIR.—The Light-house Board has the honor to inform you that the matter of establishing a permanent beacon in Raritan bay, as recommended by your commission, at the locality indicated on a piece of chart accompanying the letter addressed to the Honorable the Secretary of War, 50 N. 87, by a committee of the commission, consisting of Mr. George H. Cook and Lieut. G. C. Hanus, U. S. N. was considered by the board at its session held on this day, when, in view of the facts that the proposed beacon would not be an obstruction, and possibly might be an aid to navigation, the conclusion was reached that the board saw no objections to the establishment of the beacon as recommended by the Joint Boundary Commission.

Respectfully yours,

R. D. EVANS.
Commander U. S. N., Naval Secretary.

TREASURY DEPARTMENT, OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, D. C., *November* 8, 1887.

DEAR SIR.— The Board has received the commission's letter of November 5, 1887, making application for buoys, and for the tender to place them, and has given directions to have its wishes carried into effect.

Commodore Benham has been informed that a representative of the commission will communicate with him, and that all the details can be arranged between them.

As to the proposed beacons, formal answer in the affirmative will be made at an early day.

Very truly yours,

R. D. EVANS,
Commander U. S. N., Naval Secretary.

Lieutenant G. C. HANUS, *U. S. Navy, New York, N. Y.*

TREASURY DEPARTMENT, OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, *October* 11, 1887.

GENTLEMEN. — Your letter of October 5, 1887, asking permission to take at cost from the board's stock the buoys needed to mark the boundary line between New York and New Jersey in Raritan bay, and to have the use of a light-house tender in placing these buoys, has been received.

In reply, the board has to say that it will take pleasure in granting your request in each instance.

When your requisition for the buoys you want is received you will be instructed as to the method by which they are to be replaced in kind.

Very respectfully,

R. D. EVANS,
Commander U. S. N., Naval Secretary.

Messrs. COOK and HANUS, *Committee of the Joint N. Y. and N. J. Boundary Commission, 39 Nassau street, N. Y.*

ORIGINAL AGREEMENT AS TO BOUNDARY LINE.

Boundary Line Between New York and New Jersey.

Chapter 8.

An act establishing a boundary line between New York and New Jersey.

Passed, February 5, 1834.

An Act to confirm the agreement entered into by commissioners appointed by this State, and commissioners appointed by the State of New Jersey, to settle the boundary line between New York and New Jersey.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

The agreement entered into by the commissioners appointed by this State, and the commissioners appointed by the State of New Jersey, to settle the boundary line between New York and New Jersey, in the words following, viz.:

Agreement made between the commissioners on the part of the State of New York and the commissioners on the part of the State of New Jersey, relative to the boundary line between the two States.

Agreement made and entered into by and between Benjamin F. Butler, Peter Augustus Jay, and Henry Seymour, commissioners duly appointed on the part and behalf of the State of New York, in pursuance of an act of the Legislature of the said State, entitled "An concerning the territorial limits and jurisdiction of the State of New York and the State of New Jersey," passed January 18, 1833, of the one part, and Theodore Frelinghuysen, James Parker, and Lucius Q. C. Elmer, commissioners duly appointed on the part and behalf of the State of New Jersey, in pursuance of an act of the Legislature of the said State, entitled "An act for the settlement of the territorial limits and jurisdiction between the States of New Jersey and New York," passed February 6, 1833, of the other part.

Article I.

The boundary line between the two States of New York and New Jersey, from a point in the middle of the Hudson river opposite the point on the west shore thereof, in the forty-first degree of north latitude, as heretofore ascertained and marked, to the main sea, shall be the middle of the said river, of the bay of New York, of the

waters between Staten island and New Jersey, and of Raritan bay, to the main sea, except as hereinafter otherwise particularly mentioned.

ARTICLE II.

The State of New York shall retain its present jurisdiction of, and over Bedlow's and Ellis' islands, and shall also retain exclusive jurisdiction of and over the other islands lying in the waters above mentioned, and now under the jurisdiction of that State.

ARTICLE III.

The State of New York shall have and enjoy exclusive jurisdiction of and over all the waters of the bay of New York, and of and over all the waters of Hudson's river lying west of Manhattan island, and to the south of the mouth of Spuyten Duyvil creek, and of and over the lands covered by the said waters to the low-water mark on the westerly of New Jersey side thereof ; subject to the following rights of property and of jurisdiction of the State of New Jersey, that is to say :

1. The State of New Jersey shall have the exclusive right of property in and to the land under water, lying west of the middle of the bay of New York, and west of the middle of that part of the Hudson river which lies between Manhattan island and New Jersey.

2. The State of New Jersey shall have the exclusive jurisdiction of and over the wharves, docks and improvements made and to be made on the shore of the said State, and of and over all vessels aground on said shore, or fastened to any such wharf or dock ; except that the said vessels shall be subject to the quarantine or health laws, and laws in relation to passengers, of the state of New York, which now exist or which may hereafter be passed.

3. The State of New Jersey shall have the exclusive right of regulating the fisheries on the westerly side of the middle of the said waters, provided that the navigation be not obstructed or hindered.

ARTICLE IV.

The State of New York shall have exclusive jurisdiction of and over the waters or the Kill Van Kull, between Staten island and New Jersey, to the westernmost end of Shooters' Island, in respect to such quarantine laws and laws relating to passengers as now exist, or may hereafter be passed under the authority of that State, and for executing the same ; and the said State shall also have exclusive jurisdiction, for the like purpose, of and over the waters of the sound, from the westernmost end of Shooters' Island to Woodbridge creek, as to all vessels bound to any port in the said State of New York.

ARTICLE V.

The State of New Jersey shall have and enjoy exclusive jurisdiction of and over all the waters of the sound, between Staten Island and New Jersey, lying South of Woodbridge creek, and of and over all the waters of Raritan bay, lying westward of a line drawn from the light-house at Prince's bay to the mouth of Matavan creek, subject to the following rights of property and of jurisdiction of the State of New York:

1. The State of New York shall have the exclusive right of property in and to the land under water lying between the middle of the said waters and Staten island.

2. The State of New York shall have the exclusive jurisdiction of and over the wharves, docks and improvements made and to be made, on the shore of Staten Island; and of and over all vessels aground on said shore, or fastened to any such wharf or dock, except that the said vessel shall be subject to the quarantine or health laws, and laws in relation to passengers of the State of New Jersey which now exist, or which may hereafter be passed.

3. The State of New York shall have the exclusive right of regulating the fisheries between the shore of Staten island and the middle of the said waters, provided that the navigation of the said waters be not obstructed or hindered.

ARTICLE VI.

Criminal process issued under the authority of the State of New Jersey against any person accused of an offense committed within that State, or committed on board of any vessel being under the exclusive jurisdiction of that State, as aforesaid, or committed against the regulations made or to be made, in relation to the fisheries mentioned in the third article; and also civil process issued under the authority of the State of New Jersey against any person domiciled in that State, or against property taken out of that State to evade the laws thereof, may be served upon any of the said waters within the exclusive jurisdiction of the State of New York, unless such person or property shall be on board a vessel aground upon or fastened to the shore of the State of New York, or fastened to a wharf adjoining thereunto; or unless such person shall be under arrest, or such property shall be under seizure, by virtue of process or authority of the State of New York.

ARTICLE VII.

Criminal process issued under the authority of the State of New York against any person accused of any offense committed within this State, or committed on board of any vessel being under the exclusive jurisdiction of that State, as aforesaid, or committed against the regulations made or to be made by that State, in relation to the fisheries mentioned in the fifth article; and, also, civil process issued under the authority of the State of New York, against any person domiciled in that State, or against property taken out of that State to evade the laws thereof, may be served upon any of the said waters within the exclusive jurisdiction of the State of New Jersey, unless such person or property shall be on board of a vessel aground upon or fastened to the shore of the State of New Jersey, or fastened to a wharf adjoining thereto; or unless such person shall be under arrest, or such property shall be under seizure, by virtue of process or authority of the State of New Jersey.

ARTICLE VIII.

This agreement shall become binding on the two states when confirmed by the Legislatures thereof, respectively, and when approved by the Congress of the United States.

Done in four parts (two of which are retained by the commissioners of New York, to be delivered to the Governor of that State; and the other two of which are retained by the commissioners of New Jersey, to be delivered to the Governor of that State), at the city of New York, this sixteenth day of September, in the year of our Lord one thousand eight hundred and thirty-three, and of the independence of the United States the fifty-eighth.

B. F. BUTLER,
PETER AUGUSTUS JAY,
HENRY SEYMOUR,
THEO. FRELINGHUYSEN,
JAMES PARKER,
LUCIUS Q. C. ELMER.

The above agreement was confirmed by the Legislature of the State of New York, February 5, 1834; and by the Legislature of the State of New Jersey, February 26, 1834; and approved by the Congress of the United States, June 28, 1834.

NAVY DEPARTMENT, WASHINGTON,
April 1, 1887.

SIR. — Your letter of the twenty-sixth ult. is received, and you are informed that Lieut. G. C. Hanus has been authorized to act as commissioner under the appointment of Governor Hill, to locate the boundary line between New York and New Jersey, and that officer has also permission to leave his ship when his services on the commission are required.

Very respectfully,

W. C. WHITNEY,
Secretary of the Navy.

Mr. EDWARD P. DOYLE, *Board of Supervisors, etc., Richmond, N. Y.*

NEW YORK, *November* 2, 1887.

Clear and pleasant; very smooth sea; calm to very light westerly wind.

Angles taken at proposed site of monument to mark the turning point of the New York and New Jersey boundary line between Great Beds light and Romer beacon:

Wilson beacon to Princes Bay light, 99–41–30.
Princes Bay light to Episcopal church, 69–09–00.
Episcopal church to front, 83–14–00.
Front to Wilson beacon, 112–55–30.
Seven feet water at M. L. W.

(Copy verified.) W. G. FORD, JR.

Angles taken at buoy No. 1, on line between proposed monument and Romer beacon:

Cupola to dental works, 113–37.
Dental works to Episcopal church, 71–03.
Sixteen feet water at M. L. W.

STATE OF NEW JERSEY:

[Stamp.] EXECUTIVE DEPARTMENT,
TRENTON, *April* 14, 1887.

To His Excellency, DAVID B. HILL, *Governor, Albany, N. Y.:*

SIR.—I have the honor to inform you that the Governor has this day appointed George H. Cook, of New Brunswick, Robert C. Bacot, of Jersey City, and A. B. Stoney, of Keyport, as commissioners under joint resolution No. 6, approved April 20, 1886, of which a copy is herewith transmitted. Said commissioners to meet the commissioners appointed by yourself, March 21, 1887, as per letter of Mr. Rice of that date.

Very respectfully.

ROBERT S. GREEN, JR.,
Private Secretary.

[Enclosure.]

[Stamp.] STATE OF NEW JERSEY.

Joint resolution authorizing the appointment of a commission to locate and mark out the boundary line between the State of New Jersey and the State of New York, in Raritan bay:

WHEREAS, Disputes are constantly arising between citizens of this and citizens of the State of New York engaged in the shell fisheries in Raritan bay, as to the boundary line between the two States in lands under water of said Raritan bay; and

WHEREAS, That by reason of the absence of any means to locate the boundary line, there exists an uncertainty about the true location thereof between the State of New Jersey and the State of New York, as defined in the act entitled "An act for the settlement of the territorial limits and jurisdiction between the States of New Jersey and New York," passed the sixth day of February, one thousand eight hundred and thirty-three; now, therefore,

1. *Be it Resolved,* By the Senate and General Assembly of the State of New Jersey, that the Governor of this State be, and he is hereby authorized to appoint three commissioners with power, on the part of the State to meet any authorities of the State of New York who may be duly authorized, and with them locate and mark out by proper buoys the boundary line between the two States in lands under water in Raritan bay; that the expenses of said commission shall be paid by the treasurer, on the warrant of the Comptroller, after being first approved by the Governor.

2. *And be it Resolved,* That this resolution take effect immediately.

Approved, April 20, 1886.

STATE OF NEW JERSEY,
DEPARTMENT OF STATE.

I, Henry C. Kelsey, Secretary of State of the State of New Jersey, do hereby certify that the foregoing is a true copy of a joint resolution passed by the Legislature of this State, and approved by the Governor the twentieth day of April, A. D., 1886, as taken from and compared with the original now on file in my office.

In witness whereof, I have hereunto set my hand and affixed
[L. S.] my official seal, at Trenton, this fourteenth day of April, one thousand eight hundred and eighty-seven.

H. C. KELSEY,
Secretary of State.

STATE OF NEW JERSEY.

I, Robert S. Green, Governor of the State of New Jersey, do hereby certify that Henry C. Kelsey, Esquire, who hath signed the annexed certificate, and whose official seal is hereto annexed, was, at the doing thereof, and now is, Secretary of State of the State of New Jersey, duly appointed, commissioned and sworn, and that full faith and credit are to be given to his official attestations; that the said signature is in the proper handwriting of the said Henry C. Kelsey, and the seal his seal of office, and that the said certificate is in due form of law and by the proper officer.

In witness whereof, I have hereunto set my hand, and caused the great seal of the State of New Jersey to be hereunto
[L. S.] affixed, at the city of Trenton, in said State, this fourteenth day of April, in the year of our Lord one thousand eight hundred and eighty-seven, and of the independence of the United States the one hundred and eleventh.

ROBT. S. GREEN.

By the Governor,

HENRY C. KELSEY,
Secretary of State.

SIXTH ANNUAL REPORT

OF THE

BOARD OF CONTROL

OF THE

NEW YORK

Agricultural Experiment Station,

(GENEVA, ONTARIO CO.)

FOR THE YEAR 1887,

WITH REPORTS OF THE DIRECTOR AND OFFICERS.

TRANSMITTED TO THE LEGISLATURE JANUARY, 1888.

THE TROY PRESS COMPANY, PRINTERS.
1888.

STATE OF NEW YORK.

No. 36.

IN ASSEMBLY,

JANUARY, 1888.

REPORT

OF THE

BOARD OF CONTROL OF THE NEW YORK AGRICULTURAL EXPERIMENT STATION.

To the Honorable the Legislature of the State of New York:

I herewith respectfully submit, in behalf of the Board of Control, the Sixth Annual Report of the New York Agricultural Experiment Station. Its contents will explain the success which is now rewarding our efforts; and this, with the report of the Treasurer, renders unnecessary any extended remarks on my part.

Respectfully submitted.

JAMES McCANN,
President.

1887.

ORGANIZATION OF THE STATION.

BOARD OF CONTROL.

GOVERNOR HILL ..... *Albany.*

JAMES McCANN, President..... *Elmira, Chemung county.*

N. M. CURTIS, Secretary..... *Ogdensburg, St. Lawrence county.*

PATRICK BARRY..... *Rochester, Monroe county.*

W. A. ARMSTRONG..... *Elmira, Chemung county.*

W. W. WRIGHT..... *Geneva, Ontario county.*

CHARLES JONES..... *Geneseo, Livingston county.*

DANIEL BATCHELOR..... *Utica, Oneida county.*

J. S. WOODWARD..... *Lockport, Niagara county.*

C. C. B. WALKER..... *Corning, Steuben county.*

STATION OFFICERS.

E. Lewis Sturtevant, A. M., M. D. ..... *Director.*

C. S. Plumb, B. S.* ..... *First Assistant.*

Emmett S. Goff ..... *Horticulturist.*

M. H. Beckwith ..... *Assistant Horticulturist.*

J. C. Arthur, D. Sc.† ..... *Botanist.*

S. Moulton Babcock, A. M., Ph. D.‡ ..... *Chemist.*

E. F. Ladd, B. S ..... *Assistant Chemist.*

F. E. Newton ..... *Stenographer.*

G. W. Churchill ..... *Farmer.*

Post-office address: Geneva, Ontario Co., N. Y.

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* Resigned October first to accept professorship at University of Tennessee.

† Resigned September first to accept professorship at Purdue University.

‡ Resigned December first to accept professorship at University of Wisconsin.

TREASURER'S REPORT.

GENEVA, N. Y., *October* 1, 1887.

To the Board of Control of the New York Agricultural Experiment Station:

As Treasurer of the Board of Control, I do respectfully report:

That I have received from the Treasurer of the State of New York for the twelve months ending September 30, 1887	$20,000 00
That the balance on hand October 1, 1886, was	738 56
Total	$20,738 56

And I do further report that I have expended during the twelve months ending September 30, 1887, the sum of $19,428.75, vouchers for which, duly audited by the Special Auditing Committee of the Board of Control, have been furnished the Comptroller of the State of New York.

Properly classified, the expenditure has been as follows:

Board of Control	$714 30
Farm implements and tools	169 82
Furniture	1,231 19
Freight, cartage and express	145 14
Fuel	281 33
Labor	2,796 01
Laboratory department	396 03
Library	73 69
Meteorological department	6 30
Permanent improvement	1,379 00
Postage expenses	115 00
Printing	863 68
Repairs	290 85
Salaries	9,487 02
Scientific apparatus	19 27
Carried forward	$17,968 63

Brought forward	$17,968 63
Stationery	76 25
Sundries	68 63
Supplies	926 60
Travel	388 64
Total expenditures	$19,428 75
Balance on hand	1,309 81
Total	$20,738 56

And I do further report that I have received from sales the sum of $136.25, which sum has been duly paid to the Treasurer of the State of New York.

WM. O'HANLON,
Treasurer.

REPORT OF THE DIRECTOR.*

To the Board of Control of the New York Agricultural Experiment Station:

GENTLEMEN. — I herewith submit my sixth annual report for the calendar year 1887.

The year has been one of climatic extremes, May, June and July being much warmer than usual, the mean assumed to be that for the twelve years average published by Prof. Wilson, of Hobart College, Geneva, in 1867, and summarized in the second annual report of this station.

The following tabulation of the mean monthly temperatures for 1885, 1886 and 1887 will be found of interest, the results being those of the 7 A. M., noon, and twice the 6 P. M. readings, divided by four:

	1885.	1886.	1887.	Mean for 12 years.†
January	21.05°	20.58°	21.60°	25.29°
February	14.23	23.22	25.42	25.39
March	21.15	32.37	27.65	32.26
April	43.78	50.40	43.85	43.21
May	58.03	58.45	65.80	55.66
June	66.93	67.95	69.22	64.93
July	72.91	71.47	78.00	70.28
August	65.98	69.70	68.92	68.08
September	60.65	63.60	59.55	60.47
October	49.04	51.07	46.11	49.66
November	39.90	37.17	37.3	39.12
December	28.89	22.85	.....	25.56
	45.21	47.40	.....	46.66

The number of days upon which rain or snow was noted or recorded was for the various years:

	1882.	1883.	1884.	1885.	1886.	1887.
January	....	13	11	12	12	12
February	....	13	14	7	11	15
March	....	12	16	8	11	10
April	....	11	11	13	10	9
May	....	16	15	13	7	7
June	9	12	10	12	7	9
July	12	13	12	9	12	10
August	10	9	6	20	6	7
September	6	10	7	6	11	5
October	7	10	13	12	9	15
November	7	5	8	15	11	9
December	4	11	10	12	13	.....
Total	....	135	137	139	120	.....

* E. Lewis Sturtevant, A. M., M. D. † Hobart College figures.

The figures in this table differ slightly from those heretofore given in our reports, as the rainfalls, too slight for record, are here included.

The rainfall recorded for the several years is as below, in inches:

	1882.	1883.	1884.	1885.	1886.	1887.	Twelve years aver'ge.*
January	.....	0.48	1.83	1.07	1.13	0.18	1.59
February	.....	1.44	2.01	0.61	0.95	2.97	1.14
March	.....	0.88	2.54	0.12	1.13	0.48	1.89
April	.....	1.58	0.83	1.26	4.13	1.37	3.37
May	.....	4.45	2.49	1.58	1.92	0.46	2.93
June	3.69	4.12	2.01	2.49	2.92	2.01	2.12
July	2.42	2.98	2.33	4.64	4.41	6.37	3.28
August	2.37	3.47	1.44	5.02	2.86	3.03	3.69
September	1.25	2.12	3.17	2.11	2.31	0.75	2.50
October	0.62	2.10	1.67	2.88	1.39	1.74	2.12
November	1.22	1.54	1.01	1.36	3.48	1.58	2.25
December	0.55	0.73	0.97	0.76	1.24	.....	2.03
	.....	25.89	22.30	23.90	27.87	.....	29.91

The Hobart College observations were taken on a lower level, and about a mile and a half from the station.

The total rainfall recorded each year for the planting and preceding season, or from January to May; for the growing season, or from June to September, is as below:

	1883.	1884.	1885.	1886.	1887.
January to May—Total rainfall (inches)..	8.83	9.70	4.64	9.26	5.46
January to September—Total rainfall (inches)	12.69	8.95	14.26	12.50	12.16

The present season showed a spring drought which was far more excessive than these figures indicate, produced not alone from the deficiency of the rainfall, but from the great evaporation consequent upon high temperature and frequent winds. The following summaries of rainfall for May, June and July bring the deficiency in rain more fully to our attention than do the summaries:

	Rainfall.
May 6	.02 inches
7	.02 "
18	†.00 "
24	.15 "
25	.10 "
26	.15 "
28	.02 "
June 1	.40 "

* Hobart College figures. † Not sufficient to gauge.

	Rainfall.
June 2	.33 inches.
6	.03 "
17	.04 "
18	.40 "
19	.20 "
21	.21 "
22	.31 "
24	.09 "
July 6	.18 "
9	.53 "
10	*.00 "
15	†.00 "
16	.05 "
17	.15 "
18	.53 "
21	‡2.64 "
22	1.23 "
25	1.06 "

The temperature summary for the year is given below:

MONTHS.	Greatest heat.	Greatest cold.	Mean of maxi'm temp.	Mean of mini'm temp.	Mean monthly temp.
January	50.7°	—8.°	30.2°	10.0°	21.6°
February	54.2	1.	31.7	15.4	25.4
March	51.7	8.7	33.1	19.4	27.6
April	69.5	17.2	51.6	32.1	43.8
May	88.2	37.5	74.1	50.7	65.8
June	89.2	47.7	75.5	55.9	69.2
July	98.0	58.7	85.3	65.4	78.0
August	88.5	46.0	76.0	57.0	68.9
September	81.7	37.2	67.6	47.8	59.6
October	78.5	21.2	56.2	38.0	46.1
November	67.5	15.0	46.6	28.6	37.3
December	....	....	....	....	....

The amount of bright sunlight recorded is as follows, in hours and per cent of possible, for each month. The apparatus had its position changed on September 9, and failed to work satisfactorily in its new quarters. Hence the records for the year cease at this date:

* Not gaugeable. † In two hours.

MONTHS.	1887.		1886.	1885.
	Hours.	Per cent. of possible.	Per cent. of possible.	Per cent. of possible.
January	44.00	14.5	14.3	.....
February	61.50	18.2	26.7	.....
March	110.76	29.7	22.3	.....
April	159.00	39.9	36.3	.....
May	265.00	58.4	51.9	36.4
June	217.75	47.6	55.2	52.0
July	267.50	57.9	52.6	53.8
August	235.75	55.0	56.0	38.1
September, eight days	43.50	.....	.....	.....
September	.....	.....	53.7	55.3
October	.....	.....	41.8	39.3
November	.....	.....	34.8	18.1
December	.....	.....	24.2	17.6
The average for June, July and August, the three growing months	.....	53.5	54.6	48.0

The complex set of conditions comprehended within the term climate does not enable us to assign relationship between the amount of crop and any one factor; hence sums of temperature required for the development of any given crop cannot have uniformity under varied conditions as regarding moisture and probably sunlight. For the purpose of illustrating this point, some Philadelphia Extra Early Peas have been planted at intervals during the season, with the following result:

No.	Planted.	Vegetated.	First bloom.	First edible.	First ripe.	Weight of 100 dry peas.
1	April 20	May 4	May 25	June 10	June 23	26.7 grams.
2	May 4	May 18	June 23	July 1	July 16	25.5 grams.
3	May 18	June 3	June 23	July 1	July 23	24.2 grams.
4	June 3	June 10	July 1	July 13	July 28	25.5 grams.
5	June 15	June 23	July 16	July 28	Aug. 10	21.2 grams.
6	July 1	July 13	Aug. 2	Aug. 10	Sept 29	20.1 grams.
7	July 14	July 21	Aug. 5	Sept. 14	Oct. 3	20.8 grams.
8	Aug. 2	Aug. 10	Sept. 2	Sept. 27	.....	.....
9	Aug. 17	Aug. 23	Sept. 21	.....	.....	.....

NUMBER.	Days from planting to vegetation.	From vegetation to bloom.	From bloom to edible.	From edible to ripe.	From vegetation to ripeness.
1	14	21	16	13	50
2	14	36	9	15	50
3	16	20	9	22	51
4	7	21	12	15	48
5	8	23	12	13	48
6	12	20	8	50	78
7	7	15	40	19	74
8	8	23	25	.....	.....
9	6	29	.....	.....	.....

On account of the difficulty of observation in matters of this kind, we may believe that there is error in No. 2 and No. 7, and hence these may be excluded from the comparisons.

The sums of temperature for the remainder are, hence :

NUMBER.	Planting to veg.	Veg. to bloom.	Bloom to edible.	Edible to ripe.	Veg. to ripen'ss.
1	731°	1417°	1033°	914°	3364°
3	1062	1389	577	1700	3666
4	475	1491	956	1128	3575
5	589	1761	900	981	3642
6	956	1519	590	3109	5220
8	590	1521	1469	.....	.....
9	398	1871	.....	.....	.....

When we consider the difficulty of determining the exact day when ripeness occurs, and the loss of the early pods sometimes from mildew, we must note the uniformity of the days and the temperatures from the period from vegetation to ripeness; yet if we divide the sums of temperature by the number of days, we have for the mean temperature required 67, 71, 76, 75, etc., certainly not uniformities. The influence of climate appears, however, to have some relationship with the weight of the ripe seed.

In investigations of this character, however, it will be remembered that a degree of temperature has not equal influence upon vegetation in all portions of its scale, as all below 32° are absolutely nil, and the value of the fortieth degree and the eightieth degree are manifestly unequal. There is, hence, a greater difference in the effect upon growth between the 67° and 71° and the 71° and 75° above given than their numerical differences. If we examine the tabular data, we note that in Nos. 6 and 8 the sums of temperatures from vegetation to bloom are practically the same, distributed over twenty days in the case of No. 6, and twenty-three days in the case of No. 8; yet, in the case of Nos. 3 and 5 we have the same twenty-one and twenty-three days, with a marked difference between the sums of temperatures. From these and other considerations which our data will readily suggest, we must conclude that this method of estimating climate through the observations of plants does not admit as yet of exactness of conclusion.

While difficult to express in tabular form, yet an inspection of the soil moisture during the various periods must convince that the amount of available water is certainly as determining a cause of plant development as increase of temperature alone.

The doctrine of phenology, or the estimation of climate by the first appearance of bloom, is an attractive one, but close observation may

lead us to seriously question its adaptability for the purposes to which it has sometimes been applied. We have noticed that a succession of warm days often appears to influence the earliness of bloom more than do the sums of temperature over a more extended period. Thus the apple bloomed in May in the order 1886, 1887 and 1885, while the mean temperatures for April were 50°, 43° and 43°; for May were 58°, 65° and 58°. The following tables give the mean temperatures and the blooming of the various plants on the station grounds:

	MEAN TEMPERATURE.			
	March.	April.	May.	June.
Average of maximum, 1885	27.1°	50.7°	64.7°	74.1°
Average of maximum, 1886	37.0	60.1	65.7	75.1
Average of maximum, 1887	33.1	51.6	74.1	75.5
Average of minimum, 1885	10.3°	31.6°	44.0°	53.0°
Average of minimum, 1886	23.4	37.8	45.7	53.2
Average of minimum, 1887	19.4	32.1	50.7	55.9
Average mean, 1885	21.1°	43.8°	58.0°	66.9°
Average mean, 1886	32.4	50.4	58.4	68.0
Average mean, 1887	27.6	43.8	65.8	69.2

The date of development of several plants were:

	1885.	1886.	1887.
Cherry, first bloom	May 17.	April 26.	May 6.
Apple, first bloom	May 23.	May 6.	May 13.
Raspberry, first bloom	June 8.	May 29.	June 1.
Grape, first bloom	June 19.	June 14.	June 8.
Strawberry, first ripe	June 20.	June 9.	June 7.
Pea, first edible	June 20.	June 11.	June 10.

These figures are, however, of little interest for this discussion, and yet are worthy of presentation for future use, if only to call attention to the necessity of meteorological work as a preliminary to attempts at field work. Too much of our experimental work has been of little service on account of our not understanding sufficiently well the fundamental conditions under which growth and development have taken place. The statement may, however, concern us, that variation in crop from the influence classed under climatic may be greater than that which arises from ordinary omissions or applications of fertilizing elements, and I most seriously believe that through a proper understanding of climatic factors and physical relations thereof, we may conquer the power to influence physical conditions, so as to largely modify unfavoring climatic conditions. This conclusion may find

illustration in a short presentation of the subject of intercultural tillage.

INTRODUCTORY.

After six years of station work the time has not yet arrived for me to attempt generalization which shall embrace the whole field of agriculture, despite the temptation. I feel as yet we have not sufficient definite knowledge, and I prefer rather the acquisition of fragmentary work than that of attempting to go further than the facts observed will bear out. I may be allowed, however, to indicate a line of thought which is in harmony with facts thus far observed, and which seem in a line of correct reasoning.

The most potent factor in the production of crop is that of soil moisture, for without the necessary supply of water soil fertility becomes unavailable. The presence of water renders plant growth possible. The presence of water under the proper conditions renders soil fertility available to the plant, and under favoring climatic conditions insures full development to plant growth. To control the water of the soil, even to some extent, is to the farmer a matter of great consequence. Indeed, as a fact of observation, the local condition of the soil as regards moisture seems to account, to a far greater extent than does fertility, for the variations which are so commonly to be observed between plants growing on the same plat and under otherwise like conditions, and to one who has carefully and experimentally studied the problem of plat experimentation, the issue becomes at once made and the question is forced into prominence of whether the true problem of crop raising should not be expressed by the question how to get the fertility of the soil into crop rather than how to apply fertility to the soil.

This line of reasoning, based upon the physical properties of the soil, suggests a division of farming into two prominent propositions: 1. That the present farming should derive its profits from the fertility mined from the soil. 2. That the use of fertilizers is essential for the maintenance and improvement of the condition of our land. The corollary to these is the seeming radical conclusion that fertilizers in practical farming should not be depended upon for an immediate result in crop, but rather from the general increase of crop concurrent with successive years of farming.

In order to illustrate this line of thought by a distinct example, I will make a short and incomplete study of the process known as "cultivation," based upon data accumulated by station work and supplemented by experimental observation.

CULTIVATION.

The effect of cultivation may be looked for in two directions. 1. The direct influence upon the plant through changes of habit induced by root pruning. 2. By its effect upon the root pasturage of the plant, induced by the physical changes produced thereby. This latter view is one to which I shall here give prominence.

The following propositions are justified by our accumulative data: The water of the soil may be considered from two points of view; one, water of percolation, the other, water of capillarity; the water of percolation meaning that which passes downward by gravity, the water of capillarity meaning the water which is held and distributed by capillary action. During the growing season, evaporation is in excess of the rainfall with reference to bare soil or with reference to transpiration from plant growth. Consequently the direction of movement of the soil water in this climate is upward rather than downward. The upward movement of the water being in excess of the downward movement during the growing season, the tendency of plant food is therefore toward the surface, and the water of the drainage does not necessarily represent the amount or character of the soil fertility available for crops. The water of the rainfall rarely penetrates to the drains, as it is not sufficient to saturate the soil above the drains. The drainage water is hence water of displacement, and its composition consequently becomes but a measure of the soluble salts which have escaped the upward movement.

Evaporation is a surface phenomenon. Any process which obstructs the outlet of capillary attraction to the surface, retards evaporation. This obstruction may be anything which breaks capillary connection, whether it be straw or manure in layers beneath the surface, or whether it be recently turned sod, or whether it be a mulch of fine particles upon the surface.

Cultivation, as the term is ordinarily understood, or intercultural tillage as it is preferably to be called, pulverizes the upper soil and, effecting a soil mulch, protects the capillary outlets from surface exposure, and thus conserves the water to the soil.

The extent of the conservation of water through the prevention of evaporation by cultivation, as measured by the lysimeters in 1885, from May to September inclusive, with the rainfall of 14.42 inches, as between bare soil and cultivated soil, was about 1.4 inches, and as between cultivated land and sod land about 2.25 inches. In other words, we may arrive at a just appreciation of the effect of the process of cultivation upon modifying the physical character of the soil by the

assertion that by this means we increase the efficiency of the soil for water and have an increase of water, as expressed by equivalents to increased rainfall, of over ten per cent.; or yet otherwise expressed, the rainfall during these five months was about 1,629 tons to the acre; the gain from cultivation was a difference, as measured by the conservation of water, of over 158 tons, as against bare soil, and 250 tons as against sod land. We may express the fact for the whole year by saying that as an average for the years 1883 to 1886 inclusive (with an average rainfall of twenty-five inches), the average drainage from land in sod was 3.82 inches, from land left bare 8.15 inches, and from cultivated soil 10.03 inches, the difference between these figures representing the conservation of the water through the character of the surface.

These propositions offer quite secure ground for the explanation of the effects of intercultural tillage and for the formulating of practical directions for culture. We cannot doubt but that the process tends strongly to conserve moisture for the use of our crops, and that it may in itself determine whether, during seasons of drought, crops shall succeed or shall fail. We cannot doubt but that this process is to be explained through the prevention of the capillary interstices of the soil reaching the surface, and we must consistently believe that any process which tends to establish surface connection must tend toward the loss of water. This is a practical conclusion which can be readily verified. During the dry season of July let coarse manure be spaded into the soil in preparation of a strawberry bed, and then immediately set out the young strawberry plants. Unless timely rains intervene it will be found that these plants will perish from drought, as the coarse manure has broken the capillary connections and no supply of moisture can come from the lower areas. If, however, this land be thoroughly rolled with a heavy roller, by which contacts are established and connection with the lower soil furthered, capillary attraction will furnish a supply of water from below, and the plants will receive sufficient moisture for their growth.

The rational direction, therefore, to the farmer for carrying out intercultural tillages must be to use an implement as a means to an end, *i. e.*, the maintaining of a mulch of loose soil upon the field, the depth of this mulch to be determined by the character of the crop or by other circumstances. The timing of the process should not be arbitrary, but the intercultural tillage should be applied whenever the upper soil has regained, through the effect of rains, its connection with the lower soil and the capillary tubes become extended to the surface.

WEEDS.

In this same connection we may offer a few reflections concerning the weed problem. We will first take a few facts of experimental demonstration, as will be seen by an examination of our preceding reports.

1. That where weeds are allowed to grow freely the crops may be absolutely destroyed. In the case of corn the plants appear yellow, wilted, fail to attain proper size, and fail to form good ears, and the same phenomena may be noted with other crops.

2. The amount of fertility removed by weeds is not sufficient to establish the conclusion that the injury comes from the robbing of the soil and thus starving the plant. Furthermore, if such were the case, the application of additional manures to offset the robbery of the weeds would destroy their malign effect.

3. Weeds are not destructive through shading the ground, as experiment shows that mulches applied do not produce the same effect. If, however, we consider the enormous amount of water evaporated by these weeds during their growth, the necessity of additional water to the soil in an ordinary season during the hot months, and the appearance of the crop which indicates suffering from thirst, the conclusion becomes almost certain that the ill effect of weeds is largely due to their robbing the crop of proper moisture through their draughts upon the soil.

As interesting confirmatory evidence as to this being the true view of the weed question, we may quote the testimony of vineyardists, some of whom advocate allowing weeds to grow in their vineyards, while others advocate clean culture. Personal inquiry demonstrates the general fact that those gentlemen who advocate the leaving of weeds in their vineyards have lands which are not subject to excessive drought, while those who advocate clean culture have usually reported their soil as very permeable to water. When we consider that during the period of ripening of the wood and of the berry in the grape, dryness is an important factor both in securing the ripening and in securing the qualities, we have at once a plausible explanation. Those gentlemen who advocate the allowing of weeds to grow are thus exhausting the surplus water of the soil injurious to their interests as vineyardists, while on the other hand those gentlemen who advocate the thorough removal of weeds are conserving the water to the soil which does not contain it in excess of the needs of their occupation.

WATER TABLE.

As evaporation during the growing season is in excess of the rainfall, it becomes evident that farming success is only possible from the

existence of a stored water supply within the soil from the surplus of the season, when evaporation is somewhat checked, or from the waters accumulated from surface or saturated flow. This reserve of water has received the name of water table, and as is the case with our lakes and ponds, fluctuates in level. Unlike these, however, it is water distributed through soil, and may be called water of saturation, or in some cases, where bed rock is near the surface, water of capillarity, and is subject to exhaustion. This may be readily seen in wells, as we can observe the periodical increase or diminution, or even at times the disappearance of the water. This water table is hence of great consequence to the farmer, as furnishing the source of prevention or mitigation of droughts. When, however, this water table is too near the surface, we have present conditions unfavorable to the working of the land, and to plant growth, for agricultural plants cannot thrive with their roots in stagnant water. We may hence say of this water table as we do of fire, that it is a good servant but a bad master.

Drainage.

This water table may be controlled through the process of draining. A series of tile drains furnish a succession of outlets which establish a line above which water of flow cannot pass. We hence have a depth of soil above the drain level which is freed from the washings of the water of the water table, and which is kept from the stagnation produced by the action of water in excess; it hence retains and increases its power of capillary action, and draws regularly through this capillarity from the stored waters, never abstracting in excess of the plant needs, and occasionally in proper soil and under proper conditions of soil treatment, never stinting the water supply to the plant. This ever upward movement of water, only intermittingly interrupted through percolating water of rainfalls, conserves soil fertility within itself, and even recovers soil fertility from the layers of soil subjected to the steeping of the reservoir water. These facts suggest a direction as to the depth at which drains should be placed. A drain should not be so deeply located as to carry the water table beyond the power of capillarity to freely convey to the surface, but should be as deeply laid as consistent with this purpose of securing water movement to the surface. We observe, however, in this connection, that under some geological relations of soil, it becomes important to preserve stored water, as well as to remove the water from cultivated sections.

PLANTING.

The compression of soil beneath the seed reëstablishes capillary connections which have become broken through the process of plowing and fitting the land, and hence is of avail towards supplying a constant access of moisture to the young plant; the firming of the soil above the seed tends to conserve the soil against waste of moisture as shown in our remarks concerning intercultural tillage. It is to these circumstances that we must ascribe the good effects often noted as following a spring shower just before seed has been planted, and which consolidates the soil against the undisturbed soil below, while the surface is fined in the process of planting. An experimental illustration of this explanation may be found on page 142 of our first report, 1882, with peas and cow peas, while corroborative evidence is given in the report of the first assistant for the present year.

MOISTURE.

Moisture is the leading essential for agriculture, as there is more or less fertility present in nearly all soils, for at least a small crop, and usually in excess of the requirement of a maximum crop. As a rule in farming, were moisture under our complete control, we would not be compelled to gain from addition of expensive fertilizer what might be more cheaply mined through the control of water, and we could extract from the soil fertility in the form of plant growth commensurate with the amount of nature's disintegrations and solvings, for indefinite periods without loss, and could, through the use of the manure of the farm and proper rotation, attain even to large crops without lessening the future productivity of our soil, each area of soil possessing its proper value as expressed in crop. This thought, however, depends for its carrying into practice upon an if. We have not as yet complete control over soil moisture. We have, however, a sufficient control, even at present, to justify careful and elaborate study in this direction, as a hopeful source for means of agricultural advance. Soil physics at the present time requires study and investigation far more than soil chemistry. The demand on the station should be rather for more work in this direction, than for repeating work already well done upon fertilizer, or for original investigation upon fertilizer, for soil physics should be brought into line with soil chemistry so that the two studies could be carried upward in unison, each supplementing the deficiencies in applying to practical ends the other.

FEEDING EXPERIMENTS.

The feeding experiment reported here was undertaken with reference to the study of the effect of the food upon the milk, and for this purpose a farrow cow was selected. This cow, Ceres, was of no breed, and was received in new milk December, 1884, the exact date of calving unknown. Her yield has been as below, by months :

	1885.	1886.	1887.
	lbs.	lbs.	lbs.
January	753	444	338
February	659	403	397
March	800	437	487
April	651	354	447
May	637	568	490
June	678	590	485
July	579	571	442
August	539	543	443
September	475	554	373
October	424	559	389
November	365	465	.....
December	430	417	.....
	6,990	5,905	.....

The feeding was in twenty-day periods, and these, for the purpose of record and study, may be divided into five-day periods, and the data appear in the following table :

TABLE I.

PERIOD.	Live weight.	Hay, lbs.	Linseed meal, lbs.	Corn meal, lbs.	Bran, lbs.	Pumpkin, lbs.	Water. lbs.	Milk, lbs.
1.								
Dec. 1- 5	881	15.3	3.6	....	....	14.0	38.2	15.0
6-10	876	17.5	4.0	....	....	20.0	43.5	15.1
11-15	879	17.1	4.0	....	....	20.0	42.8	14.7
16-20	876	16.8	4.9	....	....	20.0	36.9	13.6
2.								
Dec. 21-25	867	14.4	.....	....	....	.....	40.3	12.3
26-30	854	14.3	.....	....	....	.....	35.6	10.6
31-Jan. 4	833	13.7	.....	....	....	.....	33.6	9.2
Jan. 5-9	825	12.9	.....	....	....	.....	35.6	8.8
3.								
Jan. 10-14	814	12.3	.....	5.8	....	.....	41.7	9.6
15-19	808	13.0	.....	5.6	....	.....	41.5	11.9
20-24	808	12.8	.....	6.0	....	.....	41.8	12.3
25-29	808	13.3	.....	6.0	....	.....	39.0	12.5
4.								
Jan 30-Feb. 3	816	14.6	.....	2.7	4.8	.....	53.1	12.6
Feb. 4- 8	835	16.4	.....	3.0	4.8	.....	60.9	13.6
9-13	845	15.8	.....	3.0	5.0	.....	60.8	14.3
14-18	849	15.6	.....	3.0	5.0	.....	57.4	14.9
5.								
Feb. 19-23	847	16.5	.....	....	8.0	.....	64.5	14.5
24-28	846	17.4	.....	....	9.2	.....	69.0	14.3
Mar. 1- 5	863	16.0	.....	....	10.0	.....	71.0	15.6
6-10	866	17.0	.....	....	10.0	.....	73.2	16.2
11-15	877	13.7	.....	....	17:0	.....	81.6	16.1

TABLE II.

DRY FOOD CONSUMED.

PERIOD.	Hay, lbs.	Linseed meal, lbs.	Corn meal, lbs.	Bran, lbs.	Pumpkin, lbs.	Total.
1.						
Dec. 1- 5	13.8	3.2	.....	.....	1.0	18.0
6-10	15.8	3.5	.....	.....	1.5	20.8
11-15	15.5	3.5	.....	.....	1.5	20.5
16-20	15.2	3.5	.....	.....	1.5	20.2
2.						
Dec. 21-25	12.9	.....	.....	.....	.....	12.9
26-30	12.9	.....	.....	.....	.....	12.9
31-Jan. 4	12.4	.....	.....	.....	.....	12.4
Jan. 5-9	11.7	.....	.....	.....	.....	11.7
3.						
Jan. 10-14	11.1	.....	4.8	.....	.....	15.9
15-19	11.7	.....	4.6	.....	.....	16.3
20-24	11.6	.....	5.0	.....	.....	16.6
25-29	12.0	.....	5.0	.....	.....	17.0
4.						
Jan. 30-Feb. 3	13.2	.....	2.2	4.0	.....	19.4
Feb. 4- 8	13.7	.....	2.4	4.0	.....	20.1
9-13	13.1	.....	2.4	4.2	.....	19.7
14-18	13.0	.....	2.4	4.2	.....	19.6
5.						
Feb. 19-23	13.8	.....	.....	6.8	.....	20.6
24-28	14.5	.....	.....	7.8	.....	22.3
Mar. 1- 5	13.4	.....	.....	8.5	.....	21.9
6-10	14.2	.....	.....	8.5	.....	22.7
Mar. 11-15	11.4	.....	.....	14.4	.....	25.8

TABLE III.

PERIOD.	ALBUMINOID DAILY CONSUMED IN—					Total, lbs.
	Hay, lbs.	Linseed meal. lbs.	Corn meal. lbs.	Bran, lbs.	Pumpkin, lbs.	
1.						
Dec. 1- 5	1.38	1.28	.....	.....	.14	2.80
6-10	1.58	1.40	.....	.....	.21	3.19
11-15	1.55	1.40	.....	.....	.21	3.16
16-20	1.52	1.40	.....	.....	.21	3.13
2.						
Dec. 21-25	1.29	.....	.....	.....	.....	1.29
26-30	1.29	.....	.....	.....	.....	1.29
31-Jan. 4	1.24	.....	.....	.....	.....	1.24
Jan. 5-9	1.17	.....	.....	.....	.....	1.17
3.						
Jan. 10-14	1.11	.....	.49	.....	.....	1.60
15-19	1.17	.....	.47	.....	.....	1.64
20-24	1.16	.....	.51	.....	.....	1.67
25-29	1.20	.....	.51	.....	.....	1.71
4.						
Jan. 30-Feb. 3	1.32	.....	.22	.66	.....	2.20
Feb. 4- 8	1.17	.....	.24	.66	.....	2.07
9-13	1.12	.....	.24	.70	.....	2.06
14-18	1.11	.....	.24	.70	.....	2.05
5.						
Feb. 19-23	1.18	.....	.....	1.13	.....	2.31
24-28	1.24	.....	.....	1.30	.....	2.54
Mar. 1- 5	1.14	.....	.....	1.42	.....	2.56
6-10	1.21	.....	.....	1.42	.....	2.63
11-15	.97	.....	.....	2.40	.....	3.37

The chemical data upon which these results are figured, is as below:

Date of sample.	FOOD.	Moisture.	Albuminoid.	Crude fiber.	Nitrogen free extract.	Fat.	Ash.
January 7.....	Hay.....	9.32	9.19	32.13	39.91	3.26	6.19
February 1.....	Hay.....	16.17	7.18	29.29	39.35	2.77	5.24
January 7.....	Linseed meal.....	11.61	35.52	11.75	28.22	8.34	4.56
January 7.....	Corn meal.....	16.96	8.56	1.98	66.92	4.19	1.39
January 7.....	Pumpkin.....	92.27	1.11	1.49	4.34	.16	.63
February 14.....	Wheat bran.....	15.05	14.18	9.21	53.02	2.95	5.59

Taking the last half of each period, when the influence of the preceding food may be supposed to have been largely eliminated, we have for the daily average of albuminoid fed, and product:

PERIODS.	Average daily albuminoid consumed, lbs.	Average daily live weight, lbs.	Average daily milk yield, lbs.
1.....	3.14	877	14.1
2.....	1.20	829	9.0
3.....	1.69	808	12.4
4.....	2.05	847	14.6
5.....	2.59	864	15.9

We note here that with increase of albuminoid fed, there appears in general an increase of milk yield and an increase in live weight, the exception being in periods one and five. In period one the albuminoid was mostly in the linseed meal; in period five, in the bran. The conclusion must therefore be, that: First, increase of albuminoid fed within the limits of this trial, is favorable to increase of milk and live weight. Second, that the albuminoid of the linseed meal is more favorable to live weight than is the albuminoid in the bran. Third, that the albuminoid in the bran is more favorable for milk yield than is the albuminoid in the linseed meal.

Expressed otherwise, so far as this one trial is concerned, linseed meal should be chosen as a leading portion of the ration where flesh is desired, and bran when milk is the object.

We may note also from the tables that the mixture of foods increased the amount of food consumed, and thus had a favorable effect upon the yield. Thus, during period two, of hay feeding alone, but 13.8 pounds of hay was daily eaten, while during period one, with linseed meal and pumpkins, 16.7 pounds of hay was utilized. During period five, with bran, 16.7 pounds of hay was consumed. We may hence infer that the mixture of foods was favorable in the inducing of a larger consumption, and that linseed meal and pumpkin, and wheat bran was of especial service, corn meal and bran less so, and corn

meal yet less. As these conclusions, justified by this experiment, correspond to observed experience, we may deem them trustworthy.

An examination of the monthly milk yields, as given for Ceres, and also the milk yields under the periods of trial, we ascertain that milk flow can be increased by the feed given after diminution arising either from effect of previous feeding, or from the natural diminution which comes from distance from calving.

Examining our tabular data again, we can arrange another table, as below:

PERIOD.	Average daily water drank, lbs.	Extremes for 5-day periods, lbs.	Average daily milk yield, lbs.	Average daily water in food, lbs.	Total water in food and drink, lbs.
1	40.3	36.9—43.5	14.6	19.2	59.5
2	36.2	33.6—40.3	10.2	1.3	37.5
3	41.0	39.0—41.8	11.6	2.3	43.3
4	58.0	53.1—60.9	13.8	3.7	61.7
5	69.4	64.5—73.2	15.1	4.1	73.5

While last year, with cows in calf, we could trace no relationship between the amount of water drank and the milk yield, yet this year, with a farrow cow, such a relationship appears probable. Thus arranging according to the amount of water used:

PERIODS.	Water used, lbs.	Milk yield, lbs.
5	73.5	15.1
4	61.7	13.8
1	59.5	14.6
3	43.3	11.6
2	37.5	10.2

Eliminating, so far as possible, the influence of the previous food upon the milk, by taking the last five days of each period, and we have:

PERIODS.	Water consumed in food and drink, lbs.	Milk yield, lbs.	Albuminoid consumed, lbs.
5	77.5	16.2	2.63
4	61.4	14.9	2.05
1	47.5	13.6	3.13
3	41.3	12.5	1.71
2	36.8	8.8	1.17

And this last table brings out the relation with great clearness. We may also infer from the uniformity between the amounts of water drank during the five-day subdivisions of each period, that the amount drank was strongly influenced by the character of the food, more under the bran feeding than with the hay alone, etc., in the following order: Hay and bran; hay, corn meal and bran; hay, linseed meal and pumpkin; hay and corn meal; hay.

During these feeding trials, we have the following *nutritive ratio*, or the relation between the digestible albuminoids and the digestible carbohydrates, plus the digestible fat, multiplied by 2.5, the figures under which the calculations are made, being those gained by artificial digestion of the foods used in this trial, for the albuminoid, and those given by Armsby in his Manual of Cattle Feeding for the carbohydrates and fat.

TABLE OF DIGESTIBILITY.

	Albuminoid.	Crude fiber.	Nit.—Free extract.	Fat.
Hay—January 7	64.82	64.	67.	48.
February 1	40.18	57.	61.	49.
Linseed meal	89.87	26.	91.	91.
Corn meal	62.71	62.	91.	85.
Pumpkin	100.00?	100.?	100.?	100.?
Bran	79.92	20.	80.	80.

Calculating the rations fed, in accordance with this table, we have for the average daily ration:

PERIOD.	Digestible albuminoid, lbs.	Digestible carbohydrate and fat, lbs.	Nutritive ratio.
1	2.39	10.66	1:4.5
2	0.81	7.04	1:8.7
3	1.06	10.20	1:9.6
4	1.15	9.30	1:8.1
5	1.52	11.94	1:7.9

Arranging the nutritive ratios in connection with milk yield we have:

PERIOD.	Nutritive ratio.	Milk yield, lbs.
1	1:4.5	14.1
2	1:8.7	9.0
3	1:9.6	12.4
4	1:8.1	14.6
5	1:7.9	15.9

As the feeding was with respect to the total food, *ad libitum*, these figures are rather a surprise, and seem to lead to the inference already alluded to, that quantity of albuminoid consumed has a stronger relation to the milk yield than has the nutritive ratio.

The analyses of the milk made in the course of the experiment, the mixed night and morning's milk being used, find representation in the following table:

PERIODS.	Milk yield.	Water.	Fat.	Albumen.	Sugar.	Ash.	Total solids in day's milk oz.
1.	lbs. oz.						
Dec. 1	13 9	85.60	5.03	3.70	4.94	.73	31.25
3	14 9	84.39	5.88	4.24	4.74	.75	36.37
6	15 3	84.11	5.91	4.20	5.15	.63	38.61
8	15 8	84.74	5.74	3.99	4.78	.75	37.84
10	15 0	84.59	5.72	3.92	5.08	.69	36.98
13	14 7	84.98	5.63	3.99	4.76	.64	34.70
15	15 2	85.02	5.49	4.02	4.76	.71	36.25
17	13 7	84.67	5.77	3.92	4.91	.73	32.96
20	14 10	85.02	5.32	4.05	4.91	.70	35.03
2.							
Dec. 21	14 5	84.88	5.54	4.18	4.65	.75	34.62
24	12 0	84.62	5.74	3.86	5.07	.71	29.53
27	11 6	84.84	5.85	3.86	4.77	.68	27.59
29	10 3	85.23	5.57	3.80	4.72	.68	24.18
31	9 10	84.96	5.68	4.05	4.73	.58	25.16
Jan. 3	9 2	85.44	5.29	3.86	4.73	.68	21.26
5	8 7	84.42	5.85	4.11	4.86	.76	21.03
7	9 1	85.29	5.62	3.86	4.56	.67	21.33
10	7 9	82.90	6.90	4.17	5.29	.74	20.69
3.							
Jan. 14	11 5	85.50	4.89	3.99	4.82	.80	26.24
17	11 11	85.97	4.42	4.05	4.75	.81	26.24
19	12 8	85.37	4.86	4.05	4.93	.79	29.26
21	12 8	85.17	4.96	3.42	5.71	.74	29.66
24	12 13	85.48	4.59	3.99	5.27	.67	29.77
26	12 7	86.51	4.42	3.74	4.69	.64	26.84
29	12 6	85.89	4.69	3.86	4.90	.66	27.94
4.							
Jan. 31	12 8	85.86	4.71	3.86	4.82	.75	28.28
Feb. 2	12 7	84.53	5.28	4.17	5.08	.84	30.59
5	13 11	85.54	4.85	3.99	4.85	.77	31.67
7	13 2	85.27	4.98	4.11	4.88	.76	30.93
11	14 14	85.55	4.77	3.86	5.06	.76	34.39
14	15 6	84.79	5.22	4.30	4.89	.80	37.42
16	14 14	85.38	4.99	3.99	4.95	.69	34.80
19	14 11	85.81	4.91	3.73	4.81	.74	33.35
5.							
Feb. 21	14 4	85.43	4.84	3.92	5.22	.59	33.22
23	14 7	85.75	4.83	3.92	4.82	.68	29.02
25	13 4	85.15	5.03	4.05	5.08	.69	32.08
28	15 0	84.93	4.87	5.44?	4.08?	.68	36.17
Mar. 3	16 8	85.95	4.61	3.61	5.16	.67	37.09
5	15 7	85.76	4.84	3.86	4.84	.70	35.17
7	15 11	84.95	5.55	3.99	4.84	.67	37.78
AVERAGE.							
1	14 6	84.79	5.61	4.00	4.89	.71	35.55
2	10 2	84.73	5.78	3.97	4.82	.70	25.04
3	12 2	85.70	4.69	3.87	5.01	.73	27.99
4	13 9	85.34	4.97	4.00	4.92	.77	32.68
5	14 9	85.42	4.94	4.11	4.86	.67	34.36

The average figures gained can be compared with the average digestible albuminoid consumed, and with the average water drank, as follows:

PERIODS.	Digestible albuminoid, lbs.	Water in food and drink, lbs.	Milk yield, lbs.	Total solids in milk, ozs.	Average fat, per cent.
1	2.39	47.5	14.1	35.5	5.61
5	1.52	77.5	15.9	34.3	4.94
4	1.15	61.4	14.6	32.6	4.97
3	1.06	41.3	12.4	27.9	4.69
2	0.81	36.8	9.0	25.0	5.78

We note that the total amount of solids in the milk indicates the influence of the albuminoid fed, and also upon the total yield, and yet does not seem to affect strongly the percentage of fat in the milk. It is probably a correct deduction, that by increased supply of albuminoid the milk flow is increased, and hence the total amount of fat and solids in the daily yield. We have had no results of experiments which offer decisive indications that in the presence of sufficient nutrition, the character of the food changes the percentage relations of the butter fat. It is more probable that richness of milk in butter fat is more dependent upon the individual or breed relations of the cow than upon the character of the food supply.

FEEDING FOR BEEF.

In an experiment with feeding for beef, we had for subjects the two calves purchased on July 14, 1885, as five weeks old, and reported upon in 1885. These calves weighed ninety-two pounds each on July 15, and "White Face," or Bess, weighing 194 pounds, "Red," or Jess, 161 pounds on September 7, the same amount of food having been offered each during these thirty-seven days, and a slightly larger amount having been consumed by Bess. The figures of increase for various periods can be best shown in tabular form, the conditions being alike amount of food offered each, and Bess consuming the larger quantity of food:

PERIODS.	EXTREME LIVE WEIGHTS DURING PERIODS.	
	"Bess," lbs.	"Jess," lbs.
July 14–31.—Milk	92 — 120	93 — 116
August 1–28.—Milk and grain	123 — 181	117 — 155
August 29–September 6.—Milk, grain and clover	183 — 195	157 — 162
September 7–22.—Milk, grain and clover.	194 — 207	161 — 175
September 23–October 7.—Grain and clover	220 — 235	186 — 195
October 8–22.—Grain and grass	241 — 265	196 — 215
December 7–January 4.—Hay and little grain	312 — 355	252 — 279

The following additional table gives the weights at different dates, in 1886, the feeding being of the ordinary character, hay and little grain or pasturage:

DATES.	"Bess," lbs.	"Jess," lbs.
February 1	387	313
March 1	430	354
April 6	461	386
June 1	563	462
July 3	616	510
August 3	618	525
December 1	753	590

BESS.

	Average weight lbs.	Extremes of weight during periods, lbs.	AVERAGE DAILY FOOD CONSUMED.					
			Hay, lbs.	Corn meal, lbs.	Linseed meal, lbs.	Ensilage, lbs.	Bran, lbs.	Water drank lbs.
Dec. 1–10	757	750–766	15.1	.....	3.8	.....	.....	39.4
11–20	762	735–784	11.3	8.8	.....	.....	.....	33.2
21–30	783	760–799	14.1	.....	4.1	.....	.....	45.5
31–Jan. 9	813	804–820	12.6	8.6	.....	.....	.....	34.9
Jan. 10–19	824	802–835	13.3	.....	1.9	.....	.....	32.8
20–29	839	824–850	13.1	8.3	.....	.....	.....	35.2
30–Feb. 8	857	844–868	13.9	.....	3.2	7.0	.....	38.4
Feb. 9–18	880	857–895	14.3	.....	1.8	10.0	.....	31.2
19–28	884	870–894	14.0	.....	2.1	10.0	1.6	34.1
Mar. 1–10	894	873–912	12.9	.....	3.1	10.0	2.0	31.5
11–20	895	873–910	13.4	.....	4.0	2.0	4.5	44.6
21–30	923	898–935	13.7	.....	4.0	.....	6.0	45.2

JESS.

	Average weight lbs.	Extremes of weight during periods, lbs.	AVERAGE DAILY FOOD CONSUMED.					
			Hay, lbs.	Corn meal, lbs.	Linseed meal, lbs.	Ensilage, lbs.	Bran, lbs.	Water drank, lbs.
Dec. 1–10	585	574–603	5.2	5.1	.....	.....	.....	14.9
11–20	593	581–601	7.1	.....	2.6	.....	.....	20.4
21–30	600	588–609	4.6	6.8	.....	.....	.....	15.7
31–Jan. 9	604	596–622	7.3	.....	1.6	.....	.....	17.6
Jan. 10–19	622	610–632	6.4	7.4	.....	.....	.....	19.6
20–29	632	603–648	10.7	.....	0.7	.....	.....	19.1
30–Feb. 8	657	642–669	5.6	8.0	.....	7.0	.....	15.1
Feb. 9–18	675	648–691	4.2	10.0	.....	10.0	.....	19.9
19–28	701	683–713	4.8	8.7	.....	10.0	1.5	18.7
Mar. 1–10	717	708–733	6.5	6.0	.....	10.0	2.0	20.7
11–20	733	720–742	8.1	4.1	.....	2.0	4.2	26.0
21–30	761	755–772	9.6	4.2	.....	.....	5.8	32.9

At the commencement of the winter's trial, these animals were hence about one year, five months and twenty-two days old. From the weighings of July and December 1, or one year, four months and seventeen days apart, we deduce an increase of live weight for Bess of 92 lbs. from 753 lbs., or 661 lbs., or 1.31 lbs. per day; for Jess, from 93 lbs. to 590 lbs., or 497 lbs., or 0.98 lbs. per day.

The statistics of the feeding trial are as below, the rule followed being to give hay *ad libitum*, and all the grain that each animal would eat.

We at once note the individuality of the two animals, an individuality which is pronounced throughout their whole career. As a calf and as a yearling, Jess consumed less food than Bess, and gained less in live weight, although as originally purchased, both as calves seemed of equal promise. This feature of individuality is sufficient to mask the influence of foods. Thus from December 1, 1886, to March 30, 1887, one hundred and twenty days, Bess changed from 757 to 923 lbs., or a gain of 166 lbs. for the average weighings; or from 750 lbs. to 935 lbs. for the extreme weighings, or an apparent gain of 185 lbs. Jess changed from 585 to 761 lbs., or 176 lbs. for the average weighings; or from 574 to 772 lbs. for the extremes of weight, 198 lbs. apparent gain.

We may hence say that Bess gained in flesh, during the 120 days, either 166 lbs. or 185 lbs., according to the series of figures used, while Jess gained either 176 or 198 lbs., according to the series of figures used. During this period the cattle consumed of food:

Bess — 1,617 lbs. hay; 257 lbs. corn meal; 280 lbs. linseed meal; 141 lbs. bran; 390 lbs. ensilage.

Jess — 801 lbs. hay; 603 lbs. corn meal; 49 lbs. linseed meal; 135 lbs. bran; 390 lbs. ensilage.

The albuminoid fed during this period of 120 days was:

	In hay.	In corn meal.	In linseed meal.	In ensilage.	In bran.	Total lbs.
Bess	137.75	22.00	99.45	3.15	20.00	232.35
Jess	67.78	53.75	17.40	3.15	19.40	161.22

This total albuminoid, reduced to its value in hay containing 9 per cent. of albuminoid, is equivalent to the feeding of 3,137 lbs. of hay to Bess and 1,791 lbs. of hay to Jess; or

In the case of Bess, 3,137 lbs. hay produced 166 or 185 lbs. live weight.

In the case of Jess, 1,791 lbs. hay produced 176 or 198 lbs. live weight.

Expressing this fact in another form, Bess gained 1.38 lbs. (or 1.54 lbs.) live weight per day, and Jess 1.46 lbs. (or 1.65 lbs.) per day; or, in the one case, that of Bess, 2.35 lbs. albuminoid fed daily was followed by 1.38 lbs. gain in live weight; in the case of Jess, 1.34 lbs. of albuminoid fed daily was followed by 1.46 lbs. daily increase of live weight.

The principal lesson to be derived from this trial is that conclusions drawn from experiments with few animals are extremely liable to be misleading, on account of the individuality of the animal used.

We may also note that under *ad libitum* feeding, the animals selected their own ration.

We may also note that under the circumstances of the feeding there was no profit, the increase costing more than the value of the flesh.

We may also note that from February 1 to December 1, 242 days, the average increase of live weight was 1.51 lbs. per day for Bess, and 1.14 lbs. for Jess, or a reverse result from the experimental period.

Such negative experiments as we have here reported have a certain value as showing the difficulties appertaining to the effort to generalize upon our work, and the necessity of constantly checking our experimental opinions with those derived from practical experience. They also suggest that, as growth is in many cases an attribute of breed, whether for trials of this nature thoroughbreds should not in all cases be selected as subjects for feeding trials.

PLAT EXPERIMENTATION.

POTATOES.

The twenty-one plats, one-twentieth of an acre each, grouped under letter F, were planted with White Star potatoes on May 2 and 3, the seeding single eyes, the distances twelve by fourteen inches. No ferti-

lizer was used, and the whole treatment at planting and afterwards as duplicate plats, cultivation having been practiced on May 21, June 6 and 7, June 25, July 11 and August 1. Harvesting took place September 27.

The question under investigation was as to the adequacy of the plat system to offer decisive results.

The land was in old sod in 1882, when possession was taken of the farm, and was first broken up in 1884, and from this date was subjected to various treatments and fertilizations. But three series have been exact duplicates from the commencement. These were: F 3 and F 4, corn, and 400 lbs. of fertilizer per acre in 1884; squashes, manured in the hill, in 1885; and potatoes, 400 lbs. of fertilizer per acre, in 1886.

The Yields.

C.	POTATOES.		POTATOES.	
	Merchantable, 1886.	Unmerchantable, 1886.	Merchantable, 1886.	Unmerchantable. 1887.
F 3.....	428.7 lbs.	55.0 lbs.	422.5 lbs.	33.7 lbs.
F 4.....	393.7 lbs.	42.5 lbs.	490.0 lbs.	20.7 lbs.

F 7 and F 9, squashes, manured in the hill, in 1884; tomatoes, in 1885; potatoes, with 400 lbs. fertilizer per acre, in 1886.

The Yields.

F.	POTATOES.		POTATOES.	
	Merchantable. 1886.	Unmerchantable, 1886.	Merchantable, 1886.	Unmerchantable. 1887.
F 7.....	321.5 lbs.	41.5 lbs.	421.7 lbs.	27.2 lbs.
F 9.....	145.2 lbs.	35.0 lbs.	428.0 lbs.	24.7 lbs.

F 17 and F 18 fallow in 1884; wheat, 400 lbs. fertilizer per acre, in 1885; corn, 400 lbs. fertilizer per acre, in 1886.

The Yields.

O.	CORN.		POTATOES.	
	Merchantable, 1887.	Unmerchantable, 1886.	Merchantable, 1886.	Unmerchantable, 1887.
F 17.....	574.7 lbs.	11.9 lbs.	459.2 lbs.	23.5 lbs.
F 18.....	70.8 lbs.	76.6 lbs.	312.2 lbs.	33.7 lbs.

In C we had adjoining plats, apparently in like condition in 1884, at the commencement of the trials; in 1886 F 4 yielding about twelve bushels per acre the less, and in 1887 about twenty-two bushels per acre the more; a variation of about two bushels per acre between the two years for F 3, and a variation of about thirty-two bushels per acre for F 4.

In F Series we note great variation in crop in 1886, and nearly identical crop in 1887, although more fertility must have been left in the soil of F 9 in 1876 than in F 7.

In O we had corn in 1886 under different methods of planting, and it is evident that less fertility was removed with the crop of F 18, in 1886, than with the crop of F 17. Yet in 1887, with potatoes, F 18 yielded about forty-nine bushels per acre less than F 17.

In F 19 we had a plat of like history with F 17 and 18, with the exception that no fertilizer was applied to the wheat of 1885. The yield of potatoes in 1887 was 377.5 pounds, merchantable, and 43.7 pounds unmerchantable. We notice here that while F 18 yielded about 104 bushels per acre, F 19, with less fertilizer in the rotation, and the same rotation, yielded about 126 bushels per acre, or 22 bushels per acre more.

Overlooking the rotations from 1884 to 1887, and considering only the fertilizer and manure applied, we can average our series and yields as below, calculated to acre areas:

PLAT.	Fertilizer in the rotation.	YIELD PER ACRE, BUS., 1887.	
		Merch.	Unmerch.
F I	400 lbs. fertilizer	148.9	9.6
F II	400 lbs. fertilizer	116.6	9.6
F 19	400 lbs. fertilizer	125.8	14.6
F 7	400 lbs. fertilizer and manure	140.6	8.7
F 8	400 lbs. fertilizer and manure	180.9	9.4
F 9	400 lbs. fertilizer and manure	141.0	8.2
F 10	400 lbs. fertilizer and manure	159.1	13.3
F 12	400 lbs. fertilizer and manure	143.3	6.6
F 14	400 lbs. fertilizer and 960 lbs. muriate potash	118.4	12.0
F 15	400 lbs. fertilizer and 1,120 lbs. sulph. potash	101.9	8.7
F 5	800 lbs. fertilizer	126.2	7.6
F 6	800 lbs. fertilizer	117.7	8.1
F 16	800 lbs. fertilizer	116.6	7.7
F 17	800 lbs. fertilizer	153.1	7.8
F 18	800 lbs. fertilizer	104.1	11.2
F 21	800 lbs. fertilizer	80.4	9.0
F 3	800 lbs. fertilizer and manure	140.8	11.2
F 4	800 lbs. fertilizer and manure	163.3	6.9
F 2	1,200 lbs. fertilizer	92.3	12.4
F 13	1,400 lbs. fertilizer	149.0	5.4
F 20	1,400 lbs. fertilizer	91.9	10.1

Summary and Averages.

	Extreme yields.	Average crop of merch.
3 plats, 400 lbs. fertilizer	116—148 bus.	130 bus.
5 plats, 400 lbs. fertilizer and manure	140—180 "	153 "
2 plats, 400 lbs. fertilizer and potash	101—118 "	110 "
6 plats, 800 lbs. fertilizer	80—153 "	116 "
2 plats, 800 lbs. fertilizer and manure	140—163 "	152 "
1 plat, 1,200 lbs. fertilizer	92 "	92 "
2 plats, 1,400 lbs. fertilizer	92—149 "	120 "

These figures with potatoes certainly offer no encouragement in favor of the plat system, and suggest what other considerations make probable, that the physical relations of our soil have a greater influence on crop than do the chemical relations.

We may perhaps be excused if we add, in the form of a postscript, fuller details concerning the two plats of largest and smallest yield.

Feb. 8. Yield	542.7 lbs. merchantable and	28.2 lbs. unmerchantable crop
Feb. 21. Yield	241.2 lbs. merchantable and	27.0 lbs. unmerchantable crop.
Difference	321.5 lbs.	1.2 lbs.
	107.1 bushels per acre.	0.4 bushels per acre.

F 8 in 1884 was planted with melons, with manure in the hills; in 1885 was planted to tomatoes, without manurial application; in 1886 was cropped with potatoes, 400 pounds of acid phosphate per acre being used. The yield was 129.2 pounds of merchantable, and 26.5 unmerchantable, or 43 bushels of merchantable potatoes per acre.

F 21 in 1884 was in pole beans, 400 pounds of fertilizer per acre having been used; in 1885, planted with squashes, no fertilizer being used; in 1886, planted with corn, 400 pounds fertilizer per acre. The yield was 152.2 pounds merchantable corn, and 14.4 pounds unmerchantable corn, or 38 bushels of merchantable per acre.

As a matter of record, we give the yield of each potato plat of the F series, in sequence, the plats being one-twentieth of an acre, as before stated :

	Merchantable, lbs.	Unmerchantable, lbs.	Rotten, lbs.
F 1	446.7	29.0	.....
F 2	277.0	37.2	.....
F 3	422.5	33.7	.....
F 4	490.0	20.7	.....
F 5	378.7	22.7	.....
F 6	353.2	24.2	.....
F 7	421.7	26.2	.....
F 8	542.7	28.2	.....
F 9	423.0	24.7	.....
F 10	477.5	40.0	0.7
F 11	349.8	29.0	.....
F 12	429.8	19.8	0.5
F 13	447.0	16.4	.....
F 14	355.4	36.0	.....
F 15	305.7	26.2	.....
F 16	350.0	23.2	.....
F 17	459.2	23.5	.....
F 18	312.2	33.7	.....
F 19	377.5	43.7	.....
F 20	275.7	30.5	.....
F 21	241.2	27.2	0.5

CORN.

The series C and E, of one-twentieth acre plats, were utilized as duplication tests, each plat in each series receiving like treatment. Series C was planted May 11, vegetated May 20 and 23, was cultivated June 8, June 30 and July 11, was stooked September 7, and harvested September 30. Series E was planted May 10, vegetated May 20 and 23, was cultivated May 24, June 6, June 25 and July 11, was stooked September 7, and harvested September 30. In either series the hills were 44 inches apart, and no fertilizer used. In figuring to bushels per acre, 80 pounds of ear corn are calculated as a bushel of shelled corn.

The tabular data of yields are as follows:

Series C.

PLAT.	No. of plants.	MERCHANTABLE EARS.		UNMERCHANTABLE EARS.	
		No. of ears.	Weight, lbs.	No. of ears.	Weight, lbs.
1	611	646	237.2	150	16.9
2	600	643	224.2	125	11.2
3	616	636	222.7	181	20.2
4	620	673	242.0	137	13.6
5	607	730	264.2	134	12.9
6	625	676	232.9	184	16.5
7	622	571	155.3	163	15.4
8	611	431	107.3	258	28.4
9	628	657	222.2	139	13.9
10	619	672	243.8	108	11.9
12	617	640	224.6	116	10.2
13	637	635	209.0	76	6.1
14	633	563	191.7	132	14.7
15	629	556	172.8	155	15.0
16	617	515	171.8	145	12.1
17	616	525	172.6	120	11.1
18	612	593	183.4	136	16.1
Average	619	609	204.6	145	14.5

Series E.

PLAT.	No. of plants.	MERCHANTABLE EARS.		UNMERCHANTABLE EARS.	
		No. of ears.	Weight, lbs.	No. of ears.	Weight, lbs.
1	629	694	223.8	137	11.6
2	640	650	216.9	118	8.2
3	624	631	199.0	190	18.6
5	625	663	222.2	157	13.9
6	624	613	196.1	139	11.7
7	629	558	174.2	152	15.5
8	626	562	182.7	158	15.8
9	612	628	213.6	167	15.9
10	623	589	197.6	185	19.9
11	621	563	186.0	179	18.9
12	615	519	168.1	169	16.1
13	603	518	169.1	134	15.2
14	591	535	177.6	148	16.0
15	614	554	177.5	166	20.6
16	597	555	167.1	240	27.2
17	596	574	182.2	212	24.8
18	612	510	150.1	258	27.4
19	608	470	140.2	247	30.4
20	612	450	128.2	186	17.6
Average	616	570	182.7	176	18.1

The two series, C and E, average as follows, calculated per acre:

	Series C.	Series E.
Number of plants	12,380	12,320
Number of ears, merchantable	12,180	11,400
Yield, bushels per acre, merchantable	51.1	45.7
Yield, bushels per acre, unmerchantable	3.6	4.5

The largest and smallest yields of the 17 plats in series C were, of merchantable corn, 66 bushels per acre for C 5, and 26.8 bushels per acre for C 8, a variation of 39.2 bushels. For the 19 plats of series E the largest yield was E 1, of 56 bushels per acre, the smallest yield E 20, of 32 bushels per acre, or a variation of 24 bushels, but as plat E 20 was occupied in part by the roots of a tree, we will take as the plat of least yield E 19, which gave 35 bushels per acre. The variation is hence 21 bushels.

The croppings of these plats were, for the various years:

C 5

1882. Corn,	1,600	lbs. fertilizer per acre.
1883. Potatoes,	400	" " "
1884. Corn,	400	" " "
1885. Fodder corn,	1,000	" " "
1886. Potatoes,	400	" " "
	3,800	lbs. fertilizer.

C 8.

1882. Corn,	400	lbs. fertilizer per acre.
1883. Potatoes,	400	" " "
1884. Fodder corn,	400	" " "
1885. Fodder corn,	1,000	" " "
1886. Potatoes,	400	" " "
	2,600	lbs. fertilizer.

E 1.

1882. Sod.		
1883. Corn,	400	lbs. fertilizer per acre.
1884. Potatoes,	400	" " "
1885. Cow peas,	400	" " "
1886. Potatoes,	400	" " "
	1,600	lbs. fertilizer.

E 19.

1882. Sod.		
1883. Sorghum,	400	lbs. fertilizer per acre.
1884. Potatoes,	400	" " "
1885. Oats,	400	" " "
1886. Corn,	400	" " "
	1,600	lbs. fertilizer.

In series C, we note that the plats of the largest and smallest yield have received during the rotation different quantities of fertilizer, but in series E these plats of varying yield have received the same fertilization.

In a number of the plats we have this year a like yield of merchantable corn, viz.: C 2, 3, 9, 12, and E 1 and 5. If the crop is governed by the fertilizer and previous history of the land, then these plats should all show a like history. The following summary shows, however, that the past treatment has been variable:

1882.		1883.	
C 2	Corn, manure.	Potatoes.	
C 3	Corn, 800 lbs. fertilizer.	Potatoes	400 lbs. fertilizer.
C 9	Corn, 400 lbs. fertilizer.	Potatoes	400 lbs. fertilizer.
C 12	Corn, 400 lbs. fertilizer.	Potatoes	400 lbs. fertilizer.
E 1	Sod.	Corn	400 lbs. fertilizer.
E 5	Sod.	Corn	400 lbs. fertilizer.
Total fertilizer,	1,600 lbs. x manure.		2,000 lbs.

1884.		1885.		1886.	
	Fert.		Fert.		
C 2. Corn	400 lbs.	Corn	1,000 lbs.	Potatoes	400 lbs. fertilizer.
C 3. Corn and cane,	400 lbs.	Corn	1,000 lbs.	Potatoes	400 lbs. fertilizer.
C 9. Corn	400 lbs.	Corn	1,000 lbs.	Squash	400 lbs. fert. and man.
C 12. Cane	400 lbs.	Cane	1,000 lbs.	Potatoes	400 lbs. fertilizer.
E 1. Potatoes	400 lbs.	Cow peas	400 lbs.	Potatoes	400 lbs. fertilizer.
E 5. Potatoes	400 lbs.	Corn	400 lbs.	Potatoes	400 lbs. fertilizer.
	2,400 lbs.		4,800 lbs.		2,400 lbs. x manure.

We may investigate yet further. In C 5, 7, 8, 12 and 13, we have substantially like treatment during the years 1882 to 1887, the same amount and kind of fertilizer being used each year on each plat. The yields have been per acre:

		C 5.	C 7.	C 8.	C 12.	C 13.
1882	Corn	62 bush.	No crop	28 bush.	52 bush.	50 bush.
1883	Potatoes	129 bush.	162 bush.	152 bush.	191 bush.	79 bush.
1884	Forage, green.	22½ tons.	11.0 tons.	8 tons.	19¼ tons.	50 bush.corn
1885	Forage, green.	19 tons.	12.0 tons.	19 tons.	28¾ tons.	23¾ tons.
1886	Potatoes	98 bush.	36 tons.	29 bush.	118 bush.	163 bush.
1887	Corn	66 bush.	38 tons.	27 bush.	56 bush.	52 bush.

In 1882, the corn was of different varieties; hence the figures are not strictly comparable. In 1883, the figures are all for crop, and the variation between the plat is quite large; in 1884 and 1885, the forage was of different sorts of corn and cane; in 1886, the potatoes represent different seedings; in 1887, the conditions all duplicate. The fertilizer

used alike on all these plats was 400 lbs. per acre in 1882, 1883, 1884 and 1886; 1,000 lbs. per acre in 1885, and no fertilizer in 1887.

CONCLUSIONS.

These trials indicate the utter unreliability of field experimentation, and should suffice to convince the public of the lack of certainty which attends all general conclusions gained by this process. I trust the time may arrive when this plat work instead of being forced upon experiment stations, will be so condemned that if used at all, it shall be only with the apology of a special purpose to be served, and cultivated fields shall be relegated to their only true purpose in experimentation, that of verifying results otherwise gained, or for teaching practical methods of application, or for purposes of illustration. For six years now this station has devoted much expenditure and labor to its plat areas, forced by a mistaken public sentiment, and a review of its work indicates that little or nothing has been gained in the direction of manurial questions, or questions of a general nature relating to the growing of crops. The apparatus for station research are the laboratory, the study, the garden, the greenhouse and fields, which offer space for incidental uses, and whereon experimentation can be located. The fallacy of equal areas permanently staked off, and with a historical record of treatment, is too plausible to be at once overcome, and the idea appeals so strongly to the half-educated or uneducated mind as to secure intense belief and partisan advocacy, despite the continual proofs of failure which are constantly found in the examination of published records of this sort of pseudo-scientific, so-called experiment.

That I am not alone in these conclusions can be shown by quoting from Professor Dr. Paul Wagner, Director of the Agricultural Experimental Station at Darmstadt, Germany. In speaking of field experimentation he says: "They cannot be used as a means of scientific investigation, because their results are not obvious. Many people have been led into error by assuming that general conclusions could be deduced from such experiments." "Manurial questions of general importance cannot be solved in a reliable way by field experiment to satisfy the requirements of agriculturists." "In every scientific experiment it is essential that all circumstances which can influence the result of the research must be controlled. Manurial experiments on large patches of ground—even if only a few hundred square yards—do not allow such control. The investigator cannot regulate the influences which affect the plants; he cannot change bad, or produce favorable conditions; nor can he compensate for either. He must leave his experiment to all possible chances; to the changes of weather and to various

kinds of injurious animals and insects. The dimensions of field experiment are too large to allow of exact treatment. When, however, the experiments are conducted on a condensed scale it is easy to control all the factors which influence the development of plants."

HOEING.

Although we consider the system of plat experimentation as totally unreliable for the purposes of generalization upon manurial questions, as never showing absolute relationships between fertility of land and crops, yet for the purposes of interpretation in terms of greater or less, it may sometimes be found useful as offering in its results, suggestions or verifications of ideas or conclusions elsewhere elaborated. For a useful purpose, however, even in these respects, each trial must be carefully investigated and results rejected which manifestly are dependent upon other causes than those which were intended to have applied. The following trial of the effect of intercultural tillage seems to show that the process is useful, but the rationale, which is probably a physiological question of root pruning and a physical question of retarding evaporation, finds no explanation in our trial, nor have we any note of the efficacy of the process in the given case, except the general result of increase of crop, and the special result of increase in one series and decrease in the other. It is evident that were our trials confined either to B upper or B lower, alone, the conclusions derived would have been radically different.

The trials in the B series were with Waushakum corn, the hills 44 inches apart, no fertilizer being used. B 2 was not hoed, but the weeds removed by hand. B 3 was hoed May 30, June 12 and July 9; B 4 was hoed May 26, June 4, 12, 18, 24, and July 2 and 11. The crops were stooked September 7, and harvested September 30.

PLAT.	No. of plants.	MERCHANTABLE.		UNMERCHANTABLE.	
		No. of ears.	Weight, lbs.	No. of ears.	Weight, lbs.
B 2. Upper	638	625	203.2	79	6.8
Lower	605	404	85.4	170	16.1
Total	1,243	1,029	288.6	249	22.9
B 3. Upper	641	636	208.1	75	5.9
Lower	602	510	136.3	156	12.5
Total	1,243	1,146	344.4	231	18.4
B 4. Upper	626	564	175.5	135	11.5
Lower	632	665	231.5	92	9.2
Total	1,258	1,229	407.0	227	20.7

If we consider our experiment as one trial, we have:

	No. of plants per acre.	MERCHANTABLE.	
		No. of ears, acre.	Yield per acre, bush.
B 2. Not hoed	12,430	10,290	36
B 3. Hoed three times	12,430	11,460	43
B 4. Hoed seven times	12,580	12,290	51

If we consider our experiment as in duplicate, we have:

	No. of plants per acre.	MERCHANTABLE.	
		No. of ears per acre.	Yield per acre, bush.
1.			
B 2 upper. Not hoed	12,760	12,500	51
B 3 upper. Hoed three times	12,820	12,720	52
B 4 upper. Hoed seven times	12,520	11,280	44
2.			
B 2 lower. Not hoed	12,100	8,080	21
B 3 lower. Hoed three times	12,040	10,200	34
B 4 lower. Hoed seven times	12,640	13,300	58

If we compare B 2 upper, not hoed, 51 bushels; B 3 lower, hoed three times, 34 bushels, and B 4 upper, hoed seven times, 44 bushels, we have again different figures, and so on through other changes. This trial is additional illustration of the indecisive evidence of plat work.

General Considerations.

"Is there any hope for agricultural experiment?" some may ask. I reply confidently that there was never better justification for high expectation than the present, but the hope must come through the acknowledgment of errors, and their abandonment. If we follow up successes, much can be accomplished. By working from the simple to the complex, and by investigating the separate factors which go towards making crop, by using logic boldly, and by interpreting justly, we may anticipate the obtaining of practical conclusions which shall possess the value of accuracy and certainty. We workers must openly claim that in agricultural experiment only exact scientific methods can avail, and must welcome all criticism which shows the inadequacy of our methods, and which suggests improved systems. In this my final report, I must freely acknowledge that I have yielded to public pressure

in the past to a certain extent, and have practiced less boldly than I have believed, and have recorded much work which had better been omitted.

ENSILAGE.

In our fourth annual report, page 43, we gave particulars of a trial with the silo, the material merely thrown in, and no pressure applied. The present report is a continuation of the trial.

In 1886 the fodder corn was harvested on the dates and in the amounts as given below, being a mixture of the several races, viz.: dent, flint, sweet and pop. The weighings made of the material as ready for the silo:

Aug. 16	6,089 lbs.
Aug. 18	9,235 lbs.
Aug. 19	5,106 lbs.
Aug. 20	5,519 lbs.
	25,949 lbs., or 12.97 tons.

The fodder was cut in about one inch lengths, and thrown into the silo indifferently, no treading being done except what was incidental to the leveling of the last cutting, which was done by a man with a fork. No covering was used.

November 22 an examination was made. On the surface the fodder was found to be slightly dry; for eight inches below the surface decayed and blackish, and for the next four inches white and moldy. Below twelve inches, the ensilage is dry, hot and acidulous. At a depth of two feet, dry, acid, and the temperature 93°; at three feet, the temperature 86°, and at four feet 80°, and much moister than the upper layers, yet acid.

January 31, 1887, the silo was again opened. The first foot of ensilage was black, rotten and compact, and just beneath was a very thin layer of white mold; below this the ensilage appeared bright and clean with no apparent decomposition. Odor at two feet strongly acid, and holding the intensity of smell to a depth of three feet. The temperature at six inches was 63°, at twelve inches 73°, at eighteen inches 69°, and at twenty-four inches 65°.

The facts in regard to these two trials of 1885 and 1886, are that no pressure was applied, and that the quality of the ensilage was fully as good at the period of using as has been that of ensilage from the same silo when put up under the most careful system of filling and weighting. The loss by surface rotting has been in these trials no greater

than *has* occurred under most careful systems of protection. The acidity of the contents has seemed no more pronounced than that which is usually observed in silo contents at the period of use.

The lesson of trials seems to be, that the condition requisite for the successful silo is exclusion of the air, and the presence of sufficient moisture. The means for obtaining this condition may be various, but these trials indicate that the weight of the upper layers of the material is sufficient to furnish the compression required for the successful preservation of the material below it, and as this compression is sufficiently accomplished before putrefactive fermentation can occur, there is but comparative slight loss through decay of the upper portion, while the actual surface exposed to the air becomes rather dry, and in a measure protective. It is to be noted that the upper layer, whose destruction protects the remainder, becomes decomposed only. It may strongly resemble cow dung in physical appearance, but has no putrefactive smell, at the most but that of wet and decaying wood.

Mildew and browning in ensilage does not render it unpalatable to cattle; indeed, as in dried fodder corn, it appears to act as a relish. Hence, as at present we view the proposition, the only loss in our silage is that thin layer near the surface which is absolutely rotten, and this forms but a small percentage of the mass. As this proportion must vary in its percentage to the total contents according to the capacity and the shape of the silo, it is useless to figure it for a given case.

From the experience gained at the station, we must believe that the true province of ensilage is to supplement other foods, and to serve as a condimental food, or as an appetizer. For this purpose the acid has been found, in the one careful trial made, to be beneficial. It is probably true that the amount which shall rationally constitute a portion of the daily ration, depends upon the amount of acid present, the less the acid the larger the amount which may be judiciously fed. We have never seen in corn silage any samples which have been free from acidity. We have noted that acidity is less in that portion of the silo which has been the moister at the time of filling, as the juices compressed from the material in filling have aided to exclude the air from the interstices. These observations may serve as guides for methods to be practiced in the preservation and expending of silage.

COMMERCIAL CABBAGE SEED GERMINATIONS.

The germination of cabbage seed from various seedsmen, the crop of 1885, and the trial made in January and February, 1887, gave the following figures for the white and red cabbaging class.

SEEDSMAN.	No. of packets.	No. of seed used.	No. of seed germinated.	Germination, per cent.
Gregory	36	7,200	5,173	71.8
Landreth	24	4,800	3,747	78.1
Henderson	23	4,600	3,540	76.9
Sibley	20	4,000	3,134	78.8
Thorburn	17	3,400	2,782	81.8
Tillinghast	8	1,600	1,515	94.7
Everitt	7	1,400	987	70.5
Department of Agriculture	6	1,200	1,079	89.9
Benary (Germany)	6	1,200	954	79.5
Damman & Co. (Italy)	6	1,200	577	48.1
Haage & Schmidt (Germany)	5	1,000	739	73.9
Burpee	2	400	333	83.2
Brill	2	400	341	85.2
Ferry	1	200	112	56.0
Johnson & Stokes	1	200	137	68.5
Total	164	32,800	25,150	76.7

The trials were made in duplicate, one hundred seed to each test. We noted, as has been reported by us in 1884, that but rarely exact duplication was obtained, and oftentimes a considerable variation between the results gained from the two samples counted from the same package of seed, and exposed to identical conditions. As a matter of interest we tabulate some variable trials, one for each of the seedsmen above named.

The greatest variation in a duplicate germination from same sample:

SEEDSMEN.	Per cent.	Per cent.
Gregory	87	60
Landreth	58	38
Henderson	98	74
Sibley	98	62
Thorburn	79	67
Tillinghast	86	64
Everitt	88	75
Department of Agriculture	99	90
Benary (Germany)	77	69
Damman & Co. (Italy)	54	26
Haage & Schmidt (Germany)	71	55
Burpee	98	93
Brill	97	88
Ferry	60	52
Johnson & Stokes	74	63

The series, as given, are not comparable for the purpose of obtaining information as to which seedsmen supply the best seed, as the number of trials differ. To make this evident, selecting the first six of our names, and arranging according to the magnitude of the germination per cents in this seed, we have the following order:

	Per cent.
Tillinghast	94.7
Thorburn	81.8
Sibley	78.8
Landreth	78.1
Henderson	76.9
Gregory	71.8

As we had but eight trials with Tillinghast, let us take the germination results of the first eight trials of the seed from the other seedsmen; our order of arrangement then stands:

	Per cent.
Tillinghast	94.7
Landreth	86.2
Gregory	80.0
Thorburn	77.8
Henderson	77.4
Sibley	73.6

This order would in turn be changed by any different grouping we could make from our figures, and if we desire to obtain information of this kind, we must use the same number of packets of the same varieties from each seedsman, and germinate under like conditions. From the trials here presented, we can legitimately refer to the seed from Tillinghast being of superior quality, but we cannot justly discriminate between the others named. We should mention, however, that Tillinghast's seeds were apparently in some cases selected for the purposes of trial, while the other tests were from strictly commercial samples.

DUPLICATION STUDIES.

Clawson wheat, twenty rows planted as duplicates 1886, gave the following figures, calculated to percentages. From 1,078 to 1,090 seeds constituted each planting:

ROW.	Vegetation percentage.	Per cent of plants survived winter.	Winter killing, per cent.
1	75	44	56
2	70	37	63
3	75	20	80
4	69	30	70
5	74	23	77
6	73	28	72
7	78	30	70
8	72	25	75
9	74	26	74
10	76	36	64
11	75	32	68
12	83	34	66
13	75	46	54
14	72	41	59
15	69	33	67
16	71	27	73
17	68	26	74
18	74	34	66
19	74	38	62
20	67	31	69
Average	73	32	68

Comparing the sums of the first ten and the second ten rows, we have:

	No. of seed planted.	No. of seed vegetated.	Winter killing, per cent.
First ten rows	10,848	7,989	2,393
Second ten rows	10,833	7,886	2,697
Whole twenty rows	21,681	15,865	5,090

Or expressing in percentages :

	Vegetation percentage.	Per cent of plants survived winter.	Winter killed.
First ten rows	74	30	70
Second ten rows	73	34	66
Whole twenty rows	73	32	68

Of the 21,681 seed planted, but 5,090 plants remained the following spring, or 23 per cent; that is, of the seeding 77 per cent was lost to the crop.

Using over 1,000 seed for a trial, the variation in the vegetation percentage between the rows is from 67 to 83 per cent; in the survivals through the winter, from 20 to 46 per cent, or the winter killing between these duplicate trials varied from 54 to 80 per cent of the plants that went through the winter. This variation is sufficiently large to discredit observations between plats containing this number of plants. When we figure, however, on the ten rows, we find that by using 10,000 plants, we secure sufficient uniformity. By dividing the plat into four parts of five rows each, we note the variation between the vegetation percentage is from 71 to 75; and for that of the winter survivals from 31 to 37. Probably many errors arise in experimenting by the overlooking of the numerical conditions which insure safety in comparative calculations. Had these trials, instead of being duplications been of seed from various sources, the temptation to have called the seed used on row 12 the best, and that on row 20 the poorest, would have been great; or if the results had been examined the spring following the planting, row 1 would have naturally been ascribed to the better seed, and row 3 to a poorer seed.

BOTANICAL NOTES.

In February some whole corn was fed to a cow. The washed dung furnished a number of kernels which had apparently passed unchanged through the digestive organs. Twenty-five of such kernels were dried and placed in a germinating apparatus. Thirteen, or 52 per cent germinated.

In March, some more whole corn was fed to a cow. Samples of dung containing apparently undigested kernels of corn were placed in a pot in the greenhouse, and left from March 21 to April 13, when all the corn had rotted, without germination. Parallel with this trial, thirty

kernels of seed corn were mixed with fresh cow dung, and placed in the greenhouse to vegetate. March 27, one plant appeared, another on March 28, fourteen on March 30, and five on March 31. By April 13, the remaining seed were rotten. The germination under these conditions was hence 21 out of 30, or 70 per cent.

Does the size of seed differ in large and small fruits of the same variety?

	Weight of fruit.	Size of seed.	Weight of 100 seeds.
Hubbard squash	3 lbs. 5 ounces	0.38x0.70 inches	325 grains.
Hubbard squash	3 lbs. 7 ounces	0.50x0.79 inches	480 grains.
Field pumpkin	4 lbs. 0 ounces	0.38x0.63 inches	70 grains.
Field pumpkin	8 lbs. 8 ounces	0.47x0.82 inches	240 grains.

In 1884 we had among our seedling strawberries one plant bearing five leaflets instead of the normal three. In 1885 we received from John Lovel, a strawberry grower, of Driffield, England, plants of a five-leaved strawberry, named Filbert Pine (previously noticed in Nature, Vol. XXXI, p. 601). This peculiarity of the strawberry is by no means modern. In L'Horticulture Français, 1824, "le fraisier a 5 feuilles" is mentioned among the curiosities of culture, as also by Noisette in 1829, and Chabræus in 1677 quotes Brassavolus, an author of the early part of the sixteenth century, as affirming that strawberry plants with five leaflets are commonly to be met with in the fields about Verona.

The white-fruited form of *Fragaria vesca* is abundant in the fields about Skaneateles, N. Y., as Peck observes in the Twenty-Fourth Report of the New York State Botanist. I have myself found these white-fruited forms elsewhere. In culture we have Lennig's White. White strawberries are, however, by no means modern. White Alpine, White Chili and White Wood strawberries are named among cultivated varieties by Mawe, in 1778. White strawberries are mentioned by C. Bauhin in 1596, 1623, 1671; by J. Bauhin, 1651; by Swertius, 1654; by Chabræus, 1677; by Turre, 1685; are mentioned as wild by Tragus, 1552, and Dodonæus, 1616; as cultivated by Ruellivs, 1536; Mizaldus, 1560; Lobel, 1576; Camerarius, 1586; Porta, 1592; Gerarde, 1597; Quintyne, 1793, etc.

Strawberry plants are occasionally found with double flowers, and I have frequently noted specimens with more than the usual number of petals. The double-blossomed wood strawberry is named among varieties by Mawe in 1778, and Noisette in 1829. The double blooming are also named as a species by Morison in 1669, and in Blackwell's Herbarium, 1749, by Tournefort in 1700, etc.

While upon the subject of variation we may note that variegated leaved strawberries are recorded among species by Tournefort, 1700; the gold-striped and the silver-striped leaved among varieties by Mawe in 1778.

The wood and alpine strawberries, *Fragaria vesca*, as also *F. viridis*, the green, and *F. elatior*, the Hautbois, are European. The Virginian, *F. Virginiana*, is American and reached Europe in 1629. *F. Chiloense*, the Chilian, reached Europe in 1712.

EXPERIMENT STATIONS.

Six years' experience in directing an actual experiment station seems to make it incumbent upon me, now upon the point of severing my relations, to speak somewhat of the ideal experiment station, and this I shall do very briefly, not in the spirit of complaint from lost or unappreciated opportunity, but as formulating experience gained in the hope that others may be thereby benefited.

The work at a station carries with it much responsibility on the part of the direction. In order to be efficient, this direction should be single, and should be so arranged that responsibility for success or for failure should be placed definitely where it rightly belongs. The organization of the station is faulty in this respect, and I can speak of it the more willingly as my own personal relations with the Board of Control have been of the friendliest character from the beginning to the end of my service, and no criticisms of my own can apply to any individual member of our Board, but only to the system which they represent. There should be no board of control over any station, understanding the term to imply the relations which are now indicated by law, but the director should have the sole management and the sole responsibility. The functions of a board of control should be that of a board of supervision, a position which our board of control have wisely and properly taken, who should have sole control over the financial arrangements and over the appointment or the displacement of a director. If the director in his management does not meet the views of the board as to the policy which should prevail, or to their ideas of efficiency, then the director should be removed and another person in harmony with the policy of the board should be appointed. But so long as the director retains his appointment he should have full power to secure his own employes and to carry out his own ideas of work untrammeled and unhampered by any superior direction. This course is the proper one, because the character of the work which an experiment station is expected to accomplish must depend largely for its efficiency upon a unity of direction which cannot be expected to be obtained under

committee management and through the annual change in the *personnel* of the board. The director, however, should outline his policy to harmonize with the views of the board or else resign, but there should be no half-way or compromise discordancies of view between the board and the director.

The policy which a station should pursue must vary somewhat according to the conditions it has to meet, but this may be safely said, that in general the efforts should be to eliminate local results from those which are general in their character, and to recognize that progress must come through work which has a permanent value. A large portion of the work which is done upon the station grounds, and with the regular working force of the station, could better be done elsewhere, and, indeed, cannot be done well when confined to one locality. Thus, work in pomology, which deals with varieties and variety adaptations, when confined to a specimen orchard, must in many cases be delusive, and in all cases cannot give the desired certainty of conclusion. This character of work can best be accomplished by the station maintaining a trained pomologist, whose duties shall involve the studying, through travel, of fruits as grown upon a large scale in nurseries, orchards or gardens, and who would have the privilege of referring any desired chemical or botanical questions which might arise to the station officials for study and elucidation. We may make like remarks concerning the study of breeds and the study of dairies. An expert, whose time should be spent in visiting herds or dairies and in making practical studies upon the spot, and whose conclusions should receive further study and investigation, where required, by the permanent station officials, would secure results which certainly would be reliable, and which might be of great importance. These two illustrations, which might be extended further, will serve to impress my conclusion that work at the station has been in the past entirely too local in its character, and that a policy which seeks for results and which ignores the farm, town, county or State lines, would be productive of larger benefits than have hitherto accrued to our work.

I think the Smithsonian plan of organization and work has not had the influence upon other organizations that its merits deserve. I would see our experiment station placed upon the Smithsonian footing, possessing a central band of workers to be engaged in independent research and the duties of revision and the putting out of distinct problems to selected individuals, those best capable of taking the work, regardless of their locality and residence. I would see criticism made rather upon the results obtained than upon the methods adopted. I desire to see that public and central support which would justify the

director in acting upon the lessons of universal experience, and in abandoning popular directions of experiment, which are as useless in the present as they have been in the past.

To the public I would say that they are not interested especially in the work done at the station. Their interest is connected with the whys and wherefores of the explanations and suggestions which are founded upon the work which is accomplished. It can be of little value to the farmer to know that we have raised fifty bushels of wheat to the acre. The value to him of this work of ours must consist in our ability in explaining the conditions under which this crop was gained, and in formulating suggestions whereby such results can be secured elsewhere. Experiment is not farming, and experimental ideas are not farming ideas. Experiment must deal with the hard facts of science. Agricultural experiment means the transferring of results gained through science to practical applications. The direction for experimental work must be from the simple to the complex, from the known to the unknown, and all the conclusions which are based upon assumed facts gained by an opposite procedure must be viewed with suspicion.

Fertilizer analysis for the purpose of control is not experimental work, and has no relations whatsoever that I can see to experimental work, except the bare fact of the presence of a laboratory and a skilled chemist at the experiment station. Fortunately, our station has been freed from this duty of control, and therefore only such analyses are required to be made as seem to us proper from the circumstances attending each collection. The farming public, however, not only are careless in availing themselves of such privileges as our duty to other work allows us to offer, but many of those who send samples seem to think it a hardship that they are required to exercise care in the sampling and the furnishing data relating to the sample. The demand for analysis comes more largely from agents for their own private benefit than from the farmers themselves. When the expense, both in money and time, of an analysis is considered, it seems perfectly proper for us to deny the gift of an analysis to individuals, when such analysis can have no public interest. Expressing the matter more plainly, we should not analyze an unknown fertilizer for an individual, because the results are of no benefit except to the individual. If, however, the manufacturer, brand and analysis claimed or guaranteed, are furnished, then the results may become of public interest, and we should be justified in making the analysis. In matters of this kind our rules, while reasonably enacted, must be strenuously enforced, and no farmer should expect gratuitous work in this matter unless he is willing to conform to the regulations that we require.

I have been impressed more and more each year with the desirability, nay almost the necessity, of coöperation between stations in order to accomplish satisfactorily certain kinds of work. This coöperation should be, however, of a voluntary character, leaving each station its own independence. While coöperation might be wisely directed by a central authority, yet as between the stations themselves it is wise that no authority be assumed by any single station. The study of the influence of climate can scarcely be carried forward, or at least can be carried forward but with great difficulty and uncertainty, in one locality; and there are many questions relating to the climatic influence upon plants that we should know definitely about. The desirability of coöperative work may be catalogued as follows:

1. Meteorological work should be carried forward at all the stations under like conditions of exposure and record, in order that the results gained at various places may be truly comparable.

2. Analytical results should be tabulated in the same manner at each station.

3. A few kinds of plants should be grown at the various stations from seed of the same variety supplied from the same source.

4. There should be an agreement upon the methods of sampling in certain kinds of work.

5. A single problem for investigation should be annually agreed upon in which all the stations should take part.

6. There should be an annual meeting of directors for the purpose of discussing experimental problems and offering suggestions for mutual advantage.

An agricultural museum is one of the necessities for a proper study of agriculture, for without such aid we cannot hope to thoroughly understand either animal or vegetable problems. The station has not the means, nor the room to enable a collection to be made or preserved, and perhaps it would not be desirable to make an adequate attempt even if means were more ample. A museum should be something more than a collection of curiosities. Such is the difficulty of preserving biological specimens that we cannot expect to have many complete collections. If the National Museum would attempt this work, the one collection at Washington would be sufficient for the needs of the whole country, if supplemented by smaller and local collections at our various agricultural colleges or experiment stations. At the present time I know of no collection in America which is sufficient to enable the complete study of one single vegetable under culture, or one single animal included in our farm economy.

The report of the First Assistant deals principally with the cereals, and represents much careful and painstaking work. It also gives in detail the results of trials in haymaking and with certain forage crops.

The report of the Horticulturist presents some experiments upon the physical relations of soil; these, while unfinished and scarcely sufficient for use in extended generalization, are yet of great interest, and serve to throw some light upon many causes which underlie crop production. Some years back your Director became convinced that lysimeters, as at present constructed, gave but fallacious data regarding the conditions which exist in a free soil, as the apparatus was not adapted for such a use, and as the resulting figures of drainage and drainage composition, logically interpreted, contradicted the observed facts of experience when carried out to their appropriate consummation. Mr. Goff, in the apparatus described in his report, seems to have overcome some difficulties, and seems to have designed a method of estimating the degree of certain changes which operate in a given soil, and which are allied to those occurring in a natural soil. In his report also will be found a continuation of the descriptive work on cultivated vegetables and various other data of horticultural interest, not the least of which are the verifications of previous work upon the influence of heredity as modifying the potato crop.

The report of the Assistant Horticulturist represents principally tabular data, which, taken in connection with our previous reports, will ultimately be found of service in studying the phenomenon of plant changes and influences of climate, especially when other data of like character are supplied by other institutions of similar character to our own, but working in a different region. His work on the potato scab seems to indicate that fungus is not directly accountable for this disease, but rather the alternations of checked and vigorous growth.

The work of the Chemist deals principally with butter-fat problems, and the work here recorded will, doubtless, be pronounced of permanent value. The digestion trials of the Assistant Chemist serve to add confidence to the results of this method, previously reported, while the various other problems discussed in his report furnish information of much practical interest.

There have been some changes in the *personnel* of the station staff during the calendar year. September 1, J. C. Arthur, the botanist, left to accept a professorship at Purdue University, Lafayette, Ind. October 1, our first assistant, Chas. S. Plumb, resigned to accept the professorship of agriculture at the University of Tennessee, Knoxville. His abilities, training and natural qualifications for the duties

of his position make his loss a serious one. December 1, our chemist, S. M. Babcock, accepted a professorship at the University of Wisconsin. His leaving is much to be regretted, as this station deserves and should have the best talent, and should not allow superior inducements to deprive it of the services of efficient and growing investigators.

This loss through promotion of so many members of our staff speaks volumes for the value of the station as a training ground.

The property of the station is in excellent order; the expenses have, for the past year, been kept within the appropriation, and kindly relations have existed between the officers and employes, and yet continue.

Gifts.

We are indebted to the publishers for the following list of newspapers and periodicals which have been sent to us free of charge:

American Analyst, New York, N. Y.
American Grange Bulletin, Cincinnati, Ohio.
Boston Weekly Post, Boston, Mass.
Bulletin d'Arboriculture, de Floriculture, etc., Gand.
Chautauqua Farmer, Dunkirk, N. Y.
Eastern Farmer, Waterville, Me.
Farm and Fireside, Springfield, Ohio.
Farmers' Journal, Hornellsville, N. Y.
Fruit and Grape Grower, Charlottesville, Va.
Hoard's Dairyman, Fort Atkinson, Wis.
Independent Statesman, Concord, N. H.
Industrialist, Manhattan, Kansas.
Massachusetts Ploughman, Boston, Mass.
Mirror and Farmer, Manchester, N. H.
National Live Stock Journal (weekly edition), Chicago, Ill.
National Live Stock Journal (monthly edition), Chicago, Ill.
New England Farmer, Boston, Mass.
New York Weekly Tribune, New York, N. Y.
Oil, Paint and Drug Reporter, New York, N. Y.
Orchard and Garden, Little Silver, N. J.
The Agricultural Epitomist, Indianapolis, Ind.
The American Cultivator, Boston, Mass.
The American Farmer, Baltimore, Md.
The American Florist, Chicago and New York.
The American Garden, New York, N. Y.
The American Rural Home, Rochester, N. Y.
The Cultivator and Country Gentleman, Albany, N. Y.

The Delaware Farm and Home, Dover, Del.
The Farmer, Malone, N. Y.
The Farmers' Advocate, London, Ontario, Canada.
The Farmers' Review, Chicago, Ill.
The Geneva Courier, Geneva, N. Y.
The Geneva Gazette, Geneva, N. Y.
The Home Farm, Augusta, Me.
The Husbandman, Elmira, N. Y.
The Jersey Bulletin, Indianapolis, Ind.
The Ladies' Home Companion, Springfield, Ohio.
The New England Homestead, Springfield, Mass.
The Orange County Farmer, Port Jervis, N. Y.
The Practical Farmer, Philadelphia, Pa.
The Rural New Yorker, New York, N. Y.
The Student's Farm Journal, Ames, Iowa.
The Weekly World, New York, N. Y.
Weekly Press, Philadelphia, Pa.

We desire also to acknowledge the following gifts, for which the donors have our hearty thanks:

November 12. Of D. W. Hinman, Peach Belt, Mich., 12 plants Fay's Prolific currant; also foliage, roots and wood of peach tree affected with "yellows."

November 16. Of D. Batchelor, seedsman, Utica, N. Y., a full assortment of capsicum seed.

February 15. Of A. B. Cleveland, seedsman, Cape Vincent, N. Y., a package of Alaska pea.

February 20. Of Dr. E. Palmer, Smithsonian Institution, Washington, Mexican sweet corn.

February 28. Of O. H. Alexander, seedsman, Charlotte, Vt., Montreal market cabbage seed, American Beauty peas.

February 28. Of Lucien Rust, Loudonville, O., seed of pop-corn.

March 4. Of J. S. Williston, Athens, Pa., package lettuce seed.

March 4. Of W. W. Rawson & Co., seedsmen, Boston, Mass., the offer of selection from their catalogue free of charge.

March 5. Of Daniel Batchelor, seedsman, Utica, N. Y., four packages of pepper seed and three of floral novelties.

March 5. Of J. M. Thorburn & Co., seedsmen, New York, N. Y., whatever seed in their line that may be desired.

March 7. Of W. W. Rawson & Co., seedsmen, Boston, Mass., five packages of vegetable seed.

March 17. Of Hemmingway's London Purple Co., New York, N. Y., 8 pounds London Purple.

March 19. Of C. A. Garfield, Grand Rapids, Mich., reports of Michigan Horticultural Society.

March 21. Of Dr. E. Palmer, Smith. Inst., Washington, D. C., seed from Mexico, viz.: Pachyrhizus angulatus, a gourd "Cidea Cayote," a sunflower "Mais de Teja," and Aglijria.

March 22. Of Hon. J. A. Wadsworth, M. C., Vol. XV, U. S. Census.

March 22. Of Silas L. Albertson, Roslyn, N. Y., seven packets cabbage seed.

March 26. Of B. K. Bliss, Boston, Mass., two packets tomato seed.

March 12. Of Hiram Sibley & Co., seedsmen, Rochester, N. Y., an assortment of seed.

April 1. Of Commissioner of Agriculture, Washington, D. C., numerous packages of vegetables, grass and cereal seeds.

April 4. Of J. M. Thorburn & Co., seedsmen, 15 John street, New York, N. Y., numerous packages of vegetable seeds.

April 4. Of E. M. Buechly, Greenville, Ohio, scions of Downing's Winter Maiden Blush apple.

April 4. Of A. H. Nixon, Dayton, Ohio, one Little Gem spraying pump, with set of Climax nozzles.

April 4. Of Peter Henderson & Co., seedsmen, 35 Cortlandt street, New York, N. Y., sample of seedling potato.

April 7. Of A. H. Ansley & Sons, Milo Center, Yates county, N. Y., package Ansley's Scarlet Flageolet wax bean.

April 7. Of Commissioner of Agriculture, Washington, D. C., three tubers Polaris potato; package of potato seed.

April 8. Of Commissioner of Agriculture, Washington, D. C., several packages of vegetable seed.

April 12. Of I. E. Tillinghast, seedsman, La Plume, Pa., several packages of vegetable seed.

April 12. Of E. L. Coy & Son, West Hebron, Washington county, N. Y., sample of seedling potato.

April 14. Of Commissioner of Agriculture, Washington, D. C., package of seed of Pyrethrum Roseum.

April 22. Of F. R. Palmer, Mansfield, Ohio, three plants of Palmer's seedling black cap raspberry.

April 25. Of A. W. Livingston's Sons, seedsmen, Columbus, O., three packets cabbage, and four packets cauliflower seed.

April 26. Of Chas. Carpenter, Kelley's Island, O., three plants Lucretia dewberry.

April 26. Of R. M. Morrill, Plymouth, Ind., sample of seedling potato.

April 27. Of J. A. Everitt & Co., seedsmen, Indianapolis, Ind., package Acme Evergreen sweet corn.

May. 4. Of J. D. Kruschke, Piqua, O., package sweet corn.

May 7. Of Merrill, Anthony & Co., Geneva, N. Y., one vine each of Black Madeira, Norwood, August Giant, Oriental, Bacchus, Red Wyoming, Empire State, and two each of Mary and a seedling No. 20.

May 13. Of J. J. H. Gregory, seedsman, Marblehead, Mass., samples of a new seedling potato.

May 13. Of J. D. Kruschke, Piqua, O., two dozen plants of Miami strawberry.

May 16. Of F. B. Mills, Thorn Hill, Onondaga county, N. Y., samples of Green Mountain potato.

May 17. Of G. S. Butler, Cromwell, Ct., four plants of a new raspberry, "Seedling No. 1."

May 17. Of C. C. Georgeson, Tokio, Japan, two packages of seed.

May 19. Of E. Jerome Woodford, West Candor, N. Y., package McDougal's Sheep Dip and Cattle Dressing.

May 26. Of J. G. Burrow, Fishkill, N. Y., one plant each of Downing and unnamed seedling grape.

June 1. Of the Zœktein Co., Albany, N. Y., package of an insecticide.

June 10. Of A. H. Nixon, Dayton, O., set Climax nozzles, with improvements on those previously sent.

June 25. Of S. F. Leonard, seedsman, Chicago, Ill., such seeds as we may order, free of charge.

June 28. Of Rose Manufacturing Co., New York, N. Y., package Tobacco Insecticide Soap.

July 5. Of Rose Manufacturing Co., New York, N. Y., fifty pounds Tobacco Insecticide Soap.

July 11. Of Benjamin Hammond, Fishkill, N. Y., sample packages "Hammond's Grape Dust."

July 16. Of Commissioner of Agriculture, Washington, D. C., fifteen packets turnip seed.

September 26. Of J. M. Thorburn & Co., seedsmen, New York, N. Y., flower seeds and bulbs.

September 30. Of Daniel Batchelor, seedsman, Utica, N. Y., samples of a new variety of bean.

September 18. Of W. S. Devol, Ohio Agricultural Experiment Station, seven packages of wheat.

September 18. Of William Rennie, seedsman, Toronto, Canada, ten packages of wheat.

October 1. Of Professor J. C. Arthur, LaFayette, Ind., some lavender plants.

October 31. Of H. C. Adams, Secretary, Reports of Wisconsin Horticultural Society for 1887.

INDEX OF SELECT SUBJECTS FROM PRECEDING REPORTS, 1882–86, NOT INCLUDING PRESENT REPORT.

Analyses. Ash Analyses of Corn Plant, 2d Rep., p. 163; Ash Analyses of Tobacco, 2d Rep., p. 163; of Individual Corn Stalks at various periods of growth, 2d Rep., p. 153; of Phenomenal Milk, 1st Rep., p. 25; 2d Rep., p. 156; 3d Rep., p. 60; Sugar in Corn Stalks, 1st Rep., p. 21; 2d Rep., p. 160; of Cattle Foods, etc., all Reports.

Artificial Digestion. Fourth Rep., p. 340; 5th Rep., p. 358. *We have here demonstrated that artificial digestion is a reliable method of determining the feeding value of approved foods, as distinguished from the potential value as determined by chemical analysis.*

Atavism the Result of Cross-fertilization. Third Rep., p. 154; 4th Rep., p. 97; 5th Rep., p. 54.

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Butter. Butter Yield more dependent upon the Character of than the Composition of the Food fed, 2d Rep., p. 114; Feeding of Wheat Bran advantageous towards recovery of Butter from the Milk, 2d Rep., p. 115; Relation of Butter to Fat in Milk, 3d Rep., p. 334; 4th Rep., p. 302; a Method of Detecting Adulterated Butters, 5th Rep., p. 338.

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Churning, Economy of, Influenced by Character of Food Feed, 2d Rep., p. 116. (See Butter.)

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Duplicates. A Study of and Discussion of "Duplicates," 2d Rep., p. 119; 3d Rep., p. 62; 4th Rep., p. 47. *The importance of duplication as a test of value is proven, and the worthlessness of plat-experimentation without such a test is indicated, as well as the uncertainty of all classes of work wherein duplication cannot be attained.*

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52 (see Unripe Seed); and Vegetation, 2d Rep., p. 260; duplicate, 2d Rep., p. 273; 3d Rep., p. 105. Lowest Temperature for Corn, 3d Rep., p. 118; of Mutilated Seed, 2d Rep., p. 64; Regermination, 2d Rep., p. 65; Trials, 2d Rep., pp. 59, 67; 3d Rep., p. 165; 4th Rep., p. 76; 5th Rep., p. 51.

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Lysimeter Records, 1st Rep., p. 15; 2d Rep., p. 31; 3d Rep., p. 347; 4th Rep., p 321; 5th Rep., p. 346. *These records offer interesting data for future discussion. One fact proven is the influence of cultivation in conserving the water of the soil; another is the value of a grass crop as opposed to a fallow in preventing nitrogen waste.*

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Root Distribution, 5th Rep., p. 166. See Root Washings.

Root Washings. Asparagus, 3d Rep., p. 308; Bean, 5th Rep., p. 160; Beet, 3d Rep., p. 311; Cabbage, 3d Rep., p. 313; Carrot, 3d Rep., p. 312; Cauliflower, 2d Rep., p. 219; Celery, 3d Rep., p. 314; Chard, 3d Rep., p. 311; Corn, 4th Rep., p. 263; Corn salad, 5th Rep., p. 160; Egg Plant, 5th Rep., p. 161; Endive, 3d Rep., p. 308; Grasses, 4th Rep., p. 261; Kohl-rabi, 3d Rep., p. 313; Lettuce, 3d Rep., p. 307; Mangold, 4th Rep., p. 264; Melon, 3d Rep., p. 313; 5th Rep., p. 163; Okra, 5th Rep., p. 161; Onion, 3d Rep., p. 310; 5th Rep., p. 165; Parsley, 5th Rep., p. 162; Parsnip, 3d Rep., p. 311; Pea, 3d Rep., p. 306; Potato, 4th Rep., p. 263; Radish, 3d Rep., p. 310; Spinach, 3d Rep., p. 308; Squash, 5th Rep., p. 162; Strawberry, 2d Rep., p. 219; Tobacco, 4th Rep., p. 264; Tomato, 2d Rep., p. 219; Turnip, 5th Rep., p. 163.

Seed. From Earliest and Latest Pea-pods, 2d Rep., p. 204; *this trial indicates a gain in earliness;* from Most and Least Productive Pea Plants and Pods, 2d Rep., p. 204; 3d Rep., p. 233; from Green and Ripe Seed, 3d Rep., p. 224, 232; 4th Rep., pp. 154; Relation of Seed to Quality in Fruit, 1st Rep., p. 78; 4th Rep., p. 229; 5th Rep. p. 270; Use of Large vs. Small Seed, 4th Rep., pp. 54, 152, 155; from Various Parts of the Plant, 2d Rep., p. 38; 3d Rep., pp. 199, 211; 4th Rep., pp. 153, 216; see Corn; Unripe Seed, 2d Rep., p. 39; 4th Rep., pp. 162,

209; Earliest and Latest Germinating, 4th Rep., p. 211; Weight of Various Seeds, 1st Rep., p. 82; 2d Rep., p. 72; Weight of Seed and Color Corelated, 2d Rep., p. 62; Drying of Seed Corn Promotive of Vigor, 5th Rep., p. 40; from Earliest Ripened Tomato, 3d Rep., p. 224.

Soil. Stirring the soil conserves the water of the soil, and equivalent in its effect to a watering. Shown by Lysimeter Records. See all the Reports. Record of Soil Moisture, 5th Rep., p. 180.

Soil Temperature Records. See all Reports but the first.

Station. Duties of a, 1st Rep., p. 10; 2d Rep., p. 26; 3d Rep., p. 11; 5th Rep., pp. 5, 11.

Sunflower. Experimental Growing of the Seed, 2d Rep., p. 144.

Sunshine Records, 4th Rep., p. 334; 5th Rep., p. 348.

Temperature. Relation between Temperature and Crops, 4th Rep., p. 10; 5th Rep., p. 38; Records, all Reports; Soil Temperature, all Reports.

Tobacco. A Study on Tobacco Growing, 1st Rep., p. 148; 2d Rep., p. 227; 3d Rep., p. 326.

Tomato. A New Variety Originated, 5th Rep., p. 172; Influence of Heredity upon Vigor, 5th Rep., p. 173; Use of Unripe Seed, 3d Rep., p. 224; 4th Rep., p. 209: promotive of earliness, but accompanied by loss of vigor; Seed from Earliest Fruits, 3d Rep., p. 224.

Vegetables. Testing of, all Reports.

Weeds. Prolificacy of, 1st Rep., p. 85; Quality of, 4th Rep., p. 289; 5th Rep., p. 298; Parasitic Fungi on, 4th Rep., 291; Analyses of, 1st Rep., pp. 17, 18.

Wheat. Winter-killing of, 2d Rep., p. 140; Classification of Varieties, 5th Rep., p. 67; Study of Wheat Varieties, 4th Rep., p. 112; 5th Rep., p. 67.

REPORT OF THE FIRST ASSISTANT.*

The work of the First Assistant during 1887, as in previous years, has been mostly confined to assisting the Director in field and feeding experiments, to taking various meteorological and other observations, having a general oversight of the laborers of the station, and conducting such experiments in addition to these duties as circumstances would permit. This supplementary work has been specially confined to the cereals, grasses and forage plants. The following experiments reported upon were, practically speaking, finished. Other studies were in the course of progress, but not sufficiently completed for reporting upon, when the First Assistant was called to a new field of labor. The season of 1887 has been most unsatisfactory for the study of grasses owing to the exceedingly dry weather in April and May, when the grass crop most needed moisture. The plants did not attain their proper growth, and great difficulty was experienced in securing vegetation from spring sowings. Hence it is not thought advisable to report upon the grass plots, as no fair results can be recorded.

TESTING THE PRODUCTIVENESS OF WHEAT VARIETIES.

In testing the relative productiveness of varieties of farm and garden plants, the general custom is to plant equal quantities of seed over equal areas of ground, give the plants like treatment in every respect, and at harvest publish the result of the yields. The variety or varieties producing the greatest yields are generally noted as being especially productive, or more so than those which gave a less yield in this test. However, this method of testing varieties is fallacious, as it proves nothing. Of fifty varieties, Finley may lead the list one year in productiveness, and the next rank low in the scale. The reason for this difference in yield, one year with another, is due to varied climatic, soil and other conditions. Ten plats of one-twentieth of an acre each, equally treated in every respect, year after year, from uncontrollable circumstances, will not yield like results in the quantity of crop.

This being the case, how are we to determine the relative productiveness of varieties? With the aim in view of obtaining data that

* C. S. Plumb.

might enable experimenters to adopt more satisfactory methods for this character of work, the following experiments were executed:

A piece of ground exceeding 175 feet in length was selected for the test. The soil was a clay-loam, even in character, but for one feature, that of moisture, the western part of the ground being a trifle elevated on the eastern side, and somewhat drier. This piece of land, 175 by 33 feet, was plowed, harrowed and worked in a most thorough manner. After plowing, acid phosphate at the rate of 400 lbs. per acre was applied, and harrowed in. After a thorough pulverization of the soil, the varieties of wheat mentioned below were planted eighteen inches apart, in rows extending the length of the field, the seed in the rows being two inches distant. The depth of planting was one and one-half inches, and there was one row of each variety. This experiment was designed to occupy the place now filled by plat methods, for obtaining the comparative productiveness of varieties. While it is true that an equal number of plants of one variety may require a different area of ground from the same number of plants of another variety to come to perfect development, owing to the tillering or root habit, at present we have no means for determining the relative area of ground each variety should occupy in order to meet these requirements. Consequently, the following varieties were all planted under equal conditions, so nearly as could be secured:

No.	NAME OF VARIETY.	No. seeds planted.	No. seeds vegetated.	No. plants survived winter.	Per cent seeds vegetated.	Per cent plants survived winter	Weight of grain.	Weight of straw.
1..	California Blue Stem	1,085	967	639	89.12	60.08	4 lbs. 11 ozs.	14 lbs. 6 ozs.
2..	Clawson	1,091	801	451	73.41	55.05	3 ..	8 9
3..	Diehl—Mediterranean	1,087	1,012	644	93.10	63.53	5 2	11 9
4..	Dott	1,087	930	434	85.54	46.66	3 ..	7 15
5..	Dietz White Chaff	1,084	917	464	84.50	50.59	3 14	9 10
6..	Everitt's High Grade	1,083	987	336	81.22	34.05	2 7	7 ..
7..	Extra Early Oakley	1,084	803	180	74.07	22.41	.. 13	2 6
8..	Finley	1,084	889	393	82.01	44.20	3 1	7 10
9..	Fulcaster	1,084	883	378	81.45	42.80	3 2	7 8
10..	Fultz	1,084	1,058	464	97.60	43.85	3 12	9 9
11..	Genoese	1,084	867	18	70.75	2.07	.. 2	.. 6
12..	German Emperor	1,088	818	290	75.10	35.45	2 7	6 7
13..	Golden Drop	1,086	774	362	71.26	46.77	3 3	7 12
14..	Golden Straw	1,088	721	155	66.26	21.49	.. 14	2 15
15..	Indian	1,087	70	.....	6.43	.....	.. ..	.. ..
16..	Lancaster	1,085	884	201	81.47	22.73	1 6	4 5
17..	Landreth	1,085	491	98	45.25	19.95	.. 12	2 6
18..	Lovett	1,085	780	172	71.88	22.05	1 3	3 12
19..	Martin's Amber	1,086	841	297	77.44	34.11	2 6	6 15
20..	McGhee's Red	1,085	682	159	68.85	23.31	1 4	3 4
21..	McGhee's White	1,085	711	152	65.52	21.36	.. 12	1 8
22..	Mediterranean	1,084	966	351	89.11	36.33	2 ..	5 9
23..	"Pittsford"	1,084	635	94	58.57	14.80	.. 9	1 ..
24..	Raub's Black Prolific	1,084	740	284	68.26	38.37	3 0	5 8
25..	Rice	1,084	920	282	84.87	30.65	2 4	5 7
26..	Russian May	1,084	866	304	79.88	35.10	1 12	4 7
27..	Surprise	1,084	901	330	83.11	36.62	2 7	4 12
28..	Scott (bearded)	1,084	963	495	88.82	51.40	4 12	9 11
29..	Sheriff's Four-rowed	1,084	766	43	7.06	5.61	.. 3	.. 12
30..	Swamp	1,084	978	547	90.22	55.92	5 5	12 ..
31..	Theiss	1,084	524	156	48.33	29.77	1 8	3 13
32..	Travis	1,084	733	197	67.61	26.87	1 13	6 12
33..	Treadwell (bearded)	1,084	782	326	72.14	41.68	2 14	7 13
34..	Valley	1,084	783	351	72.23	44.82	3 9	8 3
35..	Velvet Chaff	1,084	835	541	77.02	64.79	5 6	11 14
36..	Wayne County Select	1,084	720	251	66.42	34.86	2 1	6 ..
37..	Washington Glass	1,084	498	137	45.94	27.51	1 6	3 15
38..	White Blue Stem	1,085	895	530	82.48	59.21	5 7	13 8
39..	White Crimean	1,086	645	.....	59.39	.....	.. ..	.. ..
40..	White Eldorado	1,085	622	320	57.32	51.44	3 7	9 4
41..	White Rogers	1,085	749	346	69.03	46.19	4 5	13 15
42..	White Velvet	1,085	641	306	59.07	47.73	3 12	9 10
43..	York White Chaff	1,085	774	396	71.33	51.29	4 5	12 5
44..	Zimmerman	1,085	727	416	67.00	57.22	4 3	13 15

Grouping the ten varieties that passed the greatest percentage of plants safely through the winter, no apparent relation is to be seen between the per cent of plants which survived the winter and the yield of grain. Carrying this comparison further, no relation seems to exist between the yield, number and per cent of plants which survived the winter, as is seen below.

NAME OF VARIETY.	Rank in productiveness.	No. plants survived winter.	Per cent plants survived winter.	Yield.
White Blue Stem	1	530	59.21	5 lbs. 7 ozs.
Velvet Chaff	2	541	64.79	5 " 6 "
Swamp	3	547	55.92	5 " 5 "
Diehl-Mediterranean	4	644	63.53	5 " 2 "
Scott (bearded)	5	495	51.40	4 " 12 "
California Blue Stem	6	639	66.08	4 " 11 "
York White Chaff	7	396	51.29	4 " 5 "
Zimmerman	8	416	57.22	4 " 3 "
White Eldorado	9	320	51.44	3 " 7 "
Clawson	10	451	55.05	3 " 0 "

In order to determine, however, the value of duplicate results in testing one variety after this manner, twenty rows of Clawson wheat were planted in a manner indentical with the varieties. The soil in which these twenty rows were placed, was very even in its character, so that as far as external features went, the ground seemed very suitable. In the twenty rows were planted 21,681 seeds, an average of 1,084 to each row, and of these 15,865 vegetated, or 793 on an average to each row, or 72.59 per cent per row. Of the total number of seeds that vegetated, 5,090 survived the winter, averaging 254 to the row, or 32.03 per cent per row. The yield of grain from the 5,090 plants was 53 lbs. 7 ozs., an average of 3 lbs. 9 ozs. per row; of straw, 127 lbs. 9 ozs., an average of 6 lbs. 7 ozs. per row. In this experiment of duplicates, the results are fully as contradictory as in a duplicate set of plat experiments, the extremes in yield ranging from 1 lb. 11 ozs. in one row to 4 lbs. 5 ozs. of grain in another. A like variation exists in both seed vegetation and winter survival of plants. In the former case the extremes are 719 — 853; in the latter 165 — 372.

Confirming results by means of duplication is the only method by which we can hope to secure reasonably correct returns, as thereby the limit of errors may be carefully drawn. The case of this experiment simply offers additional evidence to prove the weakness of plat experimentation, and supplies data for explaining wherein this weakness lies. Until we shall be able to prove what factors are essential to correctly test the productiveness of varieties, and be able to control or interpret the workings of these factors, we cannot hope to

intelligently solve this problem by means of the plat system. That we have not thus far must be conceded; that we may ultimately succeed, we may be allowed to hope.

WHEAT PLANTING UNDER VARIABLE CONDITIONS.

A plat one-twentieth of an acre in size was fitted for wheat in the customary manner, the ground being plowed and harrowed thoroughly. Fertilizer at the rate of 400 pounds per acre was applied after plowing, and harrowed in. Eighteen rows were marked out, extending north and south, each being twenty-two inches apart and sixty-six feet long. The seed was sowed two inches apart in the row. The eighteen rows were divided into three sets, there being six rows to a set. The seed was covered to a depth of an inch and a half. The rows were treated as follows: The grain in row one was lightly covered with earth, by pulling it over the seed by means of a hoe, and the soil left undisturbed; the soil hoed over row two was walked on by the man hoeing; row three was tapped in the ordinary fashion with the blade of a hoe; the bottom of the drill of row four was beaten hard before planting, and after the seed was sowed, was covered with soil, and tapped lightly with the hoe; row five was planted, and the soil on it beaten hard with a maul; row six after planting was compacted by passing a roller over it. The succeeding six rows were planted as the preceding, and the next six the same. During the growing season the rows were hoed as occasion required. The winter was quite severe, and the plants suffered in the spring from freezing and thawing, but this served as a good test of the adaptability of the various methods to the climatic conditions. The variety used was the Clawson. The following table explains itself:

Row.	TREATMENT OF ROWS.	No. seeds planted.	Seeds vegetated.	Plants survived winter.	Per cent seed vegetated.	Per cent plants surviving winter.	Weight of grain, ozs.	Weight of straw, ozs.
1....	Covered lightly with soil.....	406	237	14	58.37	5.90	1	6
2....	Walked on.....	406	320	114	78.76	35.62	13	33
3....	Tapped with hoe.....	407	294	24	72.23	8.16	2	6
4....	Bottom of drill compacted.....	407	263	75	64.61	28.51	12	28
5....	Beaten hard with maul	407	313	94	76.90	30.03	11	25
6....	Rolled.....	406	317	125	78.07	39.43	18	37
7....	Covered lightly with soil.....	406	221	46	54.43	20.81	6	12
8....	Walked on.....	406	309	110	76.10	35.59	14	30
9....	Tapped with hoe.....	406	270	21	66.50	7.77	2	6
10....	Bottom of drill compacted.....	406	275	138	67.70	50.18	16	37
11....	Beaten hard with maul.....	406	312	96	76.84	30.76	11	24
12....	Rolled.....	407	326	120	80.09	36.80	14	32
13....	Covered lightly with soil.....	406	231	42	56.89	18.18	5	15
14....	Walked on.....	406	325	99	80.04	30.46	12	11
15....	Tapped with hoe.....	406	319	21	78.57	6.58	1	6
16....	Bottom of drill compacted.....	406	285	116	70.19	40.70	14	32
17....	Beaten hard with maul.....	407	333	61	81.81	18.31	6	18
18....	Rolled.....	407	314	59	77.14	18.78	5	14

Grouping the six methods of treatment, we are better enabled to compare the duplicate rows, as well as the other plantings:

	ROWS 1, 7, 13—COVERED LIGHTLY WITH SOIL.		ROWS 2, 8, 14—WALKED ON.		ROWS 3, 9, 15—TAPPED WITH HOE.	
	Per cent plants survived winter.	Yield. grain.	Per cent plants survived winter.	Yield grain.	Per cent plants survived winter.	Yield grain.
1.....	5.90	1	35.62	13	8.16	2
2.....	20.81	6	35.59	14	7.77	2
3.....	18.18	5	30.46	12	6.58	1
Average ..	14.96	4	33.89	13	7.50	1.66

	ROWS 4, 10, 16—BOTTOM OF DRILL COMPACTED.		ROWS 5, 11, 17—BEATEN HARD WITH MAUL.		ROWS 6, 12, 18—ROLLED.	
	Per cent plants survived winter.	Yield grain.	Per cent plants survived winter.	Yield grain.	Per cent plants survived winter.	Yield grain.
1.....	28.51	12	30.03	11	39.43	18
2.....	50.18	16	30.76	11	36.80	14
3.....	40.70	14	18.31	6	18.78	5
Average ..	39.79	14	26.36	9.33	31.67	12.33

These figures present strong evidence that compacting the soil in wheat culture aids the plant to resist winter-killing, and favors increased yield of crop. This is noticeable in all the cases where the most pressure was applied to the soil, and noticeably with rows 4, 10, 16, where the earth beneath the seed was very compact.

PERIODS OF CUTTING BARLEY.

On April 25, sixteen varieties of barley were sown on clayey-loam soil, in good condition, and well adapted to barley. No fertilizer was applied, and the ground was plowed and carefully harrowed before planting. The rows were planted twenty-four inches apart, with seed two inches apart in the row. The seeds vegetated, and the plants made a most vigorous and successful growth.

Of the varieties planted, nine were selected for cutting at different periods for the purpose of noting the effect on the weight of the seed. The first cutting was made on July 20, when the plants were all ripening, and yet were noticeably green. On July 27 the second cutting was made, when the plants were apparently in a fair condition for cutting, being neither green nor over ripe. The third and final cutting was made on August 2, when the plants were what might be termed "dead ripe," the green matter having entirely disappeared.

After threshing, 1,000 kernels were counted out from the cuttings of the different varieties, and carefully weighed on the balance. It is but proper to say that there was much resemblance in the maturing of the plants in all nine rows. The seed planted came from Vilmorin, Andrieux et Cie., Paris, France, and the following are the varieties tested: Escourgeon Black, Escourgeon Spring, Guymalaye or Namto, Italian, Large Naked, Rice, Six-rowed, Two-rowed, and Very Early Lapland. The following table explains itself:

VARIETIES OF BARLEY TESTED.

Weight in Grams of 1,000 *Grains.*

DATE CUT.	Escourgeon Black.	Escourgeon Spring.	Guymalaye.	Italian.	Large Naked.	Rice.	Six-rowed.	Two-rowed Black.	Very Early Lapland.
	gr.	gr.	gr.	gr.	gr.	gr.	gr.	gr.	gr.
July 20	43.4	37.1	39.4	44.4	56.8	48.5	32.6	47.9	40.3
27	46.1	36.9	40.8	49.3	58.7	47.5	32.8	49.2	39.1
Aug. 2	45.7	39.3	41.1	50.4	64.6	49.1	34.4	51.6	41.6
Second weighing:									
July 20	44.4*	36.7	.....	.....	.....	.....	.....	.....	.....
27	45.6	37.3	.....	.....	.....	.....	.....	.....	.....
Aug. 2	46.2	38.5	.....	.....	.....	.....	.....	.....	.....

The above table offers some very interesting figures. In every case excepting that of Escourgeon Spring barley, the third cutting gave heavier grain than did the first. A second weighing was made of the grain of this variety, which resulted in giving a sequence in weight analogous to the other eight. In five of the nine varieties the increase in weight was constant from the first to the last. A second weighing of the three cuttings of Escourgeon Spring was also made, with the result that the returning figures gave a constant increase from first to last cutting.

Adding the gross figures together for the several cuttings, we find that 9,000 kernels from the cutting of July 20 weighed 390.4 grams; the second cutting 400.4 grams, and the third 418.0 grams. The average weight of 1,000 kernels of these nine varieties gives 43.4 grams for the first cutting, 44.5 grams for the second and 46.4 grams for the third.

While this experiment cannot be regarded as conclusive, the results secured positively indicate, so far as they go, that for the year 1887, under the conditions in which this barley was planted and grown, that

* But 500 grains were weighed in this variety the second time, owing to lack of kernels. This quantity is multiplied by two to give the approximate weight of 1,000 grains.

plants which fully matured and ripened before cutting produced heavier grain than those cut at early or medium maturity.

Maercker* states from experiments carried on relating to the chemical composition of barley, that the harvest should be made at dead-ripeness, or at least full ripeness for good quality. If the above experiment does not point toward wrong conclusions, then it may reasonably be considered that good quality and heavy weight of grain occur to the most certain extent, other things being equal, when the grain is fully or dead ripe.

EFFECT OF SIZE OF SEED ON RESULTING OAT CROP.

From the farm granary 1,000 of the smallest and an equal number of the largest oat seed were carefully selected. While the aim was to secure extremes so far as size was concerned, the matter of vitality was not overlooked. The 1,000 large grains, which we will designate as A, weighed one and one-fourth ounces; the small lot nine-sixteenths of an ounce. On May 4 the lots A and B were planted side by side in four rows each, there being 250 seeds in each row. The clay-loam soil was fairly moist, not manured, and in a very good condition of tillage. The rows were placed two feet apart, the seed being about three inches apart in the row.

On May 12 it was noted that the selected large seeds were vegetating more rapidly than were the small, and were making a good growth. On June 8 the number of vegetations were found to be as follows: Large seed, 823 plants; small, 650. June 23 it was noted that the plants on A rows were larger and more robust, and had a taller growth than the plants of B. As the season advanced the plants from large seed began to ripen slightly in advance over those from small seed. On August 6 both large and small seedings were cut. The plants of the individual rows of each lot were threshed separately, with the following results:

ROW.	LOT A—LARGE.		LOT B—SMALL.	
	Grain.	Straw.	Grain.	Straw.
1	3 lbs. 4 ozs.	9 lbs. 2 ozs.	2 lbs. 6 ozs.	8 lbs. 11 ozs.
2	2 lbs. 9 ozs.	8 lbs. 8 ozs.	1 lb. 14 ozs.	7 lbs. 12 ozs.
3	2 lbs. 10 ozs.	7 lbs. 15 ozs.	2 lbs. 1 oz.	7 lbs. 13 ozs.
4	3 lbs. 7 ozs.	9 lbs. 3 ozs.	2 lbs. 10 ozs.	8 lbs. 2 ozs.
Total	11 lbs. 14 ozs.	34 lbs. 12 ozs.	8 lbs. 15 ozs.	32 lbs. 6 ozs.

* Biedermann's Centralblatt fur Agrikulturchemie, 1886.

Of the grain produced, 10,000 seeds of each lot were carefully weighed on the balance, with the following result:

Lot A—Large Seed.		Lot B—Large Seed.	
Row 1	20.30 grams.	Row 1	18.80 grams.
2	20.00 "	2	18.80 "
3	20.50 "	3	19.00 "
4	19.70 "	4	19.20 "
5	19.60 "	5	19.10 "
6	20.20 "	6	19.00 "
7	19.90 "	7	20.60 "
8	19.50 "	8	19.40 "
9	19.40 "	9	19.10 "
10	20.10 "	10	19.10 "
Average	19.92 "	Average	19.21 "

It can be seen from the above figures that there is a visible, appreciable gain, in every way, of the progeny of the large over the small seed, in per cent of vegetation, rapidity of development of plant, yield of grain and straw and weight of seed. This experiment simply illustrates the wisdom of planting selected seed.

VEGETATION OF OATS AT DIFFERENT DEPTHS.

On May 6, a piece of ground well adapted to oats, being of clayey loam and very level in surface, was thoroughly pulverized and then carefully smoothed over and compacted on the surface. Ten rows were planted, each being twelve inches apart; the seeds were four inches apart in the row. By means of an instrument that could be registered to penetrate the ground at various depths forcing the seed along on its point, 1,000 seeds of oats were planted, there being 100 grains in a row. The following are the depths planted: One-fourth, one-half, three-fourths, one, one and one-half, two, three, four, five and seven inches. After forcing the seed into its position, the hole was filled with the fine surrounding soil. The following table gives the results of these vegetations for eleven successive days, with the final results as counted on June 23, which also represents the percentage of vegetation.

Number Vegetated at Dates Noted.

DEPTH PLANTED.	May 11.	May 12.	May 13.	May 14.	May 15.	May 16.	May 17.	May 18.	May 19.	May 20.	May 21.	May 23.	June 23.
¼ inch	....	....	....	....	....	....	....	....	....	....	....	....	53
½ inch	....	....	....	....	....	....	....	....	....	....	....	....	88
¾ inch	23	30	10	....	1	3	....	....	....	....	....	....	87
1 inch	82	7	1	....	....	....	1	....	....	....	2	....	94
1½ inch	89	7	....	1	....	....	....	1	....	....	....	....	98
2 inches	66	26	1	....	....	1	....	....	....	....	....	....	94
3 inches	7	77	5	1	2	....	....	....	....	....	....	....	92
4 inches	....	23	60	4	1	6	....	....	....	....	....	....	94
5 inches	....	....	37	32	12	11	....	....	....	1	....	....	83
7 inches	....	....	2	1	6	21	20	15	1	2	2	....	70

On May 11 the one and one-half inch depth vegetated 89, the greatest number of any depth, and it is be noted that on June 23 this depth showed the largest percentage of vegetation, one month after the last count made in May. When these seeds were planted the soil was quite dry, owing to the small amount of rainfall which occurred in April and May. The two rows with seeds at one-fourth and one-half inch did not vegetate for over three weeks, the surface soil was so dry. When counted on June 23 the percentage of vegetation was very low for one-fourth inch, and quite low for one-half inch. These two rows were very backward all the season, and did not mature and ripen seeds with those planted at greater depth; neither did they attain the height and robustness of the plants in the other rows. On August 3 the seedings from three-fourths to five inches were much in advance of the others, although when cut those planted at a depth of seven inches were not very tardy in development.

As with similar experiments conducted with wheat in 1885–6 at this station, one and one-half inch seems to be the most suitable depth at which to plant oats, in order to secure permanent moisture to insure early vegetation. On dry ground, or during a dry season, the ill effects from broadcast seeding can be well illustrated from the growths made at one-fourth and one-half inch in this experiment.

FALL PLANTING OF OATS.

On September 30, 1886, seventeen varieties of oats were planted, with the purpose in view of learning if any of these would withstand the severity of our northern winter. The winter oat is commonly known in the Middle or Southern States, where the severity of the winter is not sufficient to kill the plant after a good vegetation has taken place. Of the following named oats, thirteen are distinctly so-called winter varieties, being specially adapted to southern latitudes, the others being common to the North. The winter varieties made a very good growth, throwing out an abundance of fine, grassy leaves which matted close to the ground. The other varieties made the customary rather erect growth, with a medium amount of coarse foliage. These plants did very well until winter set in, and became covered with snow. By spring, however, each and every plant of all varieties was dead and brown. Not one had survived the cold and freezing and thawing. The following are the so-called varieties planted:

1, Burt's Extra Early Rust Proof; 2, Georgian; 3, Georgia Red Rust Proof; 4, Grazing; 5, Harris; 6, Mammoth Russian; 7, Milliard's Kansas Hybrid; 8, Red Rust Proof; 9, Rousse Couronne; 10, Rust

Proof; 11, Virginia Winter; 12, Zonette; 13, Gray Houdon; 14, Longfellow; 15, Pringle's Hybridized Hulless; 16, White Australian; 17, White Russian.

Winter Sowing of Oats and Barley.

Much has been written in the agricultural press during the past two years regarding sowing oats in winter on the snow where wheat had failed. This method was advocated as a means of securing a crop from ground that would otherwise rest idle.

On February 10, 1887, when the ground was generally covered with snow, with here and there bare patches exposed, a plat one-twentieth of an acre in area was sown to White Russian oats, partly on snow, partly on the soil. The seeding was quite generous. Another plat of the same dimensions near by, was sown to common two-rowed barley, in about the same proportions as the oats. After this date (February 10), snow fell to a more or less degree at intervals during sixteen days up to April 18, when the precipitation was steady all day from 10 A. M. till night. During the period between February 10 and May 1 the extremes of air temperature were 65° and 6.7° F. above zero.

As vegetation began its growth in spring, these two seedings began to develop, but the progress was slow and no advance in earliness was made over the ordinary seeding of grain later in the spring; in fact the plants were more tardy than were the early seedings made in 1886, as recorded on pages 130, 131, 132, of the report of this station for 1886. It was noted that a large percentage of the seed sown did not vegetate. As the season advanced the plants made a poor showing, and it was thought that they would give a very meagre yield. The latter part of June, however, the oats began to develop rapidly and soon made a very good appearance, as compared with those in the field. On July 21st, the barley, and on the 29th the oats were cut, and the resulting harvest gave the returns, expressed in round numbers, in the following table:

	Sown.	Harvested.	Yield grain, lbs.	Yield straw, lbs.	Rate per acre grain, bush.	Rate per acre straw, lbs.
Barley	Feb. 10	July 21	20	31	8	620
Oats	Feb. 10	July 29	72	126	45	2,530

While the barley yield is very inferior, it is better than no crop at all from land on which the crop first planted is lost. The oat yield is very good, and favorably compares with the average yields of most farms.

This experiment was tried on a broader scale on the farm, several acres being sown after the manner described above. Although the

soil was the poorest, physically speaking, of any of the 125 acres of the station, this seeding did very well and gave a fair return in crop. The character of the soil of the plat is clayey loam, which is easily worked; that where planted on the farm was a hard, compact clay not underdrained. Where the ground was quite moist (not wet), the oats did very well, but on the knolls rather poorly, as would have any grain planted in the ordinary manner.

There need be no hesitation on the part of the farmer to sow either oats or barley in late winter or early spring on ground where some fall-sown crop has made a failure. The risk is little, and the chance for a gain through the medium of their crop is very great.

EVAPORATION OF MOISTURE IN CONVERTING GRASS TO HAY.

From a piece of grass, consisting mostly of Meadow Fescue (*Festuca pratensis*), with a little Red Clover (*Trifolium pratensis*), two lots of 200 pounds each were selected. This grass was very even as growing in the field, and was cut by the mowing machine. Both lots were spread as in ordinary haying, covering an area of twenty by twenty feet, with a very good exposure to sunshine. It was a typical hay-day, with a light breeze blowing. The first weighing of the grass was made at 8 A. M., June 14, immediately after cutting, and thereafter every hour until 6 P. M. The grass was carefully raked up and weighed, and immediately after respread. The following are the figures secured, that for 7 A. M. being the weight of the hay in the cock the next morning at that time. At 6 P. M. of the first day the hay was cocked up, and the experiment was carried no further the next day than to weigh at 7 A. M.:

HOUR WEIGHED.	Weight of lot I, lbs.	Weight of lot II, lbs.	Difference in weight between lots I, and II, lbs.
8 A. M.	200.00	200.00	.....
9 A. M.	172.50	180.50	8.00
10 A. M.	157.00	166.50	9.50
11 A. M.	137.25	147.50	10.25
12 M.	125.25	130.50	5.00
1 P. M.	106.25	116.25	10.00
2 P. M.	94.00	103.00	9.00
3 P. M.	87.75	95.50	7.75
4 P. M.	83.00	88.25	5.25
5 P. M.	78.87	87.00	9.00
6 P. M.	74.75	83.50	8.75
7 A. M.	76.25	84.75	8.50

Admitting that this experiment was conducted on a day when the meteorological conditions were most favorable for hay-making, we find that the greatest loss in moisture occurred between 8 A. M. and 2 P. M., after which the percentage of loss diminished to a slight extent. It is a striking fact that one lot lost over fifty per cent in the same time. Finally lot I lost 62.68 per cent in weight, and II, 58.25 per cent. The weather conditions were so favorable that the one day's drying sufficed, leaving it in suitable condition for storing in the barn.

FORAGE CROPS—ALFALFA (*Medicago sativum*).

In the report of the First Assistant for 1886, on pages 135 and 136, is given the record for that year of the Alfalfa crop grown at the station. The following brief notes are given as supplementary to the ones of 1886:

On May 7 the plants had reached a height of eight inches, and were making a strong, healthy growth. One week later the plants were nearly twelve inches high as an average, and presented a fine appearance. This growth continued strong and healthy, with an abundance of foliage, so that by May 30, when the plants were cut, they had an average height of two feet in A gore, while in one small plat of 100 square feet the average height was two and one-half feet. Four crops were cut during the season, leaving a splendid aftermath for grazing. The weights of the crops were as follows:

May 30, yield at rate of 14,525 pounds green fodder per acre.

July 7, yield at rate of 2,030 pounds dry fodder per acre.

August 3, yield at rate of 10,897 pounds green fodder per acre.

September 5, yield at rate of 8,487 pounds green fodder per acre.

Excepting in the yield of dry fodder, the difference in yield is not material. In this case the Alfalfa hay of 1886 was made from the largest crop, the one first cut; hence the weight of hay would in consequence be smaller. It is a noticeable fact that with each succeeding growth, the plants assume a tendency to blossom earlier than the preceding crop, without attaining its height. The plants also become woody earlier. Whether for hay or green fodder, this plant should always be cut before it becomes woody and tough. The cows, for some unexplained reason, have not eaten Alfalfa this year as greedily as common, and in one case, when considerable grown in a young orchard was allowed to bloom and become a trifle woody, the cattle would not eat it at all well.

One-half acre of Alfalfa was sown on the farm, on May 17, in a clay-loam soil, in the same manner as clover is planted. A very good vegetation was secured, much better than in an adjoining sowing of

Hungarian grass. At the present time this station has about two acres of ground devoted to Alfalfa, and, although it may be fairly stated that the seed is expensive, and large vegetations not certain after sowing, the five years' experience, as grown here, certainly indicates, if not proves, that Alfalfa will thrive and do well in this climate, and where good seedings are secured will yield a large, valuable crop, especially during dry weather.

PRICKLY COMFREY.

At Clifton Springs, N. Y., Dr. Henry Foster maintains a very large dairy farm. For several years he has grown prickly comfrey and fed it to his cattle in large quantity. At the time when I made my visit to his farm, sixty head of Holstein-Frisian grades were receiving two feedings a day of this fodder, in addition to two other feedings of corn ensilage. Dr. Foster assured me that his cows preferred this plant to any other green fodder he could supply them with. Very generally speaking, this plant has not been successfully used as fodder in America, yet there was a case in which a practical feeder used this plant largely as the most economical and desirable fodder present.

Securing settings from Dr. Foster on April 30, about one-twentieth of an acre of heavy clay-loam was planted in rows three feet apart, with roots one foot apart, in half of the rows, and two feet apart in the others. Although the weather was very dry for the month of May, the plants came on and grew at a remarkable rate, so that in less than four weeks a portion of the plants had to be cut back, owing to the plants coming to flowering. On June 6 some of the plants were a foot high, and at that time all were cut back to within three or four leaf buds from the ground. By July 11 the plants had grown to such an extent as to furnish a large yield of foliage, so that it was cut and offered to six cows. The comfrey was first placed in the mangers; it was scarcely touched. Corn meal was then sprinkled upon it, and while the cows ate the fodder better, they rather preferred to brush off the meal and lick it from the bottom of the mangers. Water was then sprinkled upon the plants, and meal dusted over them, but the cows still refused to eat to any extent. As a last resource, salt was scattered over the mangers, and the animals were thus induced to eat the fodder. Of the six cows, four evinced no special liking for it, while two apparently ate it with great relish. After eating all the comfrey in their mangers they were fed that left by the other cows, which they greedily ate. Later, the balance of the comfrey was fed to these two cows, of which they ate every leaf unprepared in any way. On September 27 the plants were again cut back, and the fod-

der given to the cows. It is an interesting fact, and confirms Dr. Foster's experience, that, before this last cutting was gone, all of the cows ate prickly comfrey with a relish, and four of them voraciously. The last cutting of fodder was given the cows as drawn from the plat, without addition of salt or meal.

ENSILAGE.

During the summer of 1887, the station received from Mr. James Wood of Mt. Kisco, Westchester county, N. Y., an apparatus imported from England, which is used there for the purpose of compressing open air silos. This instrument, which is in many respects like that used in compressing hay, is described as follows by the manufacturers. The description is accompanied by an illustration in the pamphlet which adds to its clearness: "The foregoing illustration of an open air stack of ensilage under pressure, shows the arrangement of poles or bars under and across the top of the stack, and chains which are looped around the projecting ends of the poles or bars. The gear as shown is fully extended, and has a ring on the upper bar into which the hook on the lever fits. The lever is shown attached to the gear, and ready for pressing down; this lever is only hooked into the ring on the upper bar of the gear, and a bolt regulated by a spring lever attached to the handle of the lever passes through the forked ends of the lever and the lower perforated bar of the gear, keeping all fast while pressure is being applied. When the lever is first pressed downwards a spring pawl attached to the upper bar of the gear is forced out of its position — where it has been keeping the strain tight — but when the lever is fully pressed down this pawl is immediately forced into position again at the next hole in the bars by the action of the spring, thus keeping the pressure secure from hole to hole, and allowing the lever to be unhooked from the gear for use elsewhere at any time. The gear consists of parallel flat bars working in slats."

On August twenty-fifth the construction of our silage stack in the open air was begun. Three stringers four by four inches were first laid level, with stones of good size placed beneath them to prevent sagging of the beams. Across these were placed two-inch planks, leaving spaces of a few inches between each. The area intended for the stack was placed at ten by ten feet. The stringers projected some distance beyond the area referred to, in order to allow the passage of the chains over them, and to furnish additional space if necessary for building out the stack. The foundation was begun on a very slight hillside, but not enough so to allow of a level placing of the stringers without digging slightly into the ground. This afterwards proved to

be undesirable, as the weight of the fodder placed in the stack was so great as to bend the beams, especially where the greatest space beneath stack and ground occurred. Further, when great pressure was brought to bear upon the beams, they did not endure the strain as well as was expected, and would have broken off had not a cross stringer been placed beneath them, around which the chains were passed. The south end of the stack was elevated twelve inches above the surface of the ground.

Before the fodder was placed on the platform, a layer of straw about eight inches deep was scattered evenly over it. In the afternoon of August 25, timothy grass was placed to the extent of 1,889 lbs. upon the platform. On the twenty-sixth, well ripened Alfalfa was thrown on the timothy, 2,723 lbs. being placed over it, and additional to this, 7,500 lbs. of Hungarian grass that had passed the bloom into the milk state. The Alfalfa was considerably wilted, while the timothy and Hungarian were quite fresh. The next day, August 27, the stack was completed by adding 1,800 lbs. more of Hungarian grass, and 5,865 lbs. of timothy, orchard, lawn and such other grasses as could be secured upon the place. The stack at this time had reached a height of eight feet, with other dimensions of fourteen feet, and contained 19,777 lbs. of green stuff, all of the available grass at hand.

After giving the sides of the stack a thorough raking down, planks, as at the bottom, were laid over the top of the stack, and across these three more stringers of the same size as the others were placed, and over which medium-sized cable chains ten feet long were passed. One end of the chain should have a strong two-inch ring, and the other end a grab-hook. Over the opposite ends of the stringers were placed chains to which the hooks of the gear could be attached. Connecting the lever with the gear, the beams were brought under pressure gradually from opposite ends, and thus the stack was compressed. But the cross-beams were found to be too slender, so that six by six ones were obtained, and these found to be none too large. The most desirable cross-timbers would be of tough stringers from the forest, with one side hewn flat.

While no temperatures were taken of the degree of heat in the stack, it was noted that within a week the contents were exceedingly hot, and rapidly settled, finally lowering to a height of four and one-half feet. On September 30 the silo was cut into for a distance of about five feet from the south side, and to the bottom planks. At the top the ensilage was decayed from six to twelve inches in depth, not being rotten or offensive in the general acceptance of the term, but much discolored, and rather dry. The greatest loss came from the sides, which were

spoiled for about twenty-four inches; on the under side the ensilage was decayed from two to six inches. Otherwise the contents were found to be in very satisfactory condition. There was almost no discernible acidity present, and the ensilage was the sweetest and most wholesome yet made at this station, or yet seen by the writer. When the silo was cut into, it was hardly warm — not enough so to cause comment. As fed to six cows the silage was well relished, even though the animals were having green fodder fresh cut every day, and was eaten with avidity.

Had there been enough available fodder so that this stack could have been built to a height of fourteen or sixteen feet, probably the loss would have been much less from decay. Occasionally mouldy spots of no special consequence were found, and this was especially true where the Alfalfa, and an occasional cornstalk occurred.

The general condition of the contents of this stock indicate that no injury would come to the fodder through exposure to the cold of winter.

REPORT OF THE HORTICULTURIST.*

Synopsis of Work Reported.

A test of varieties of the potato, with a report of experiments.
Experiments in root growth.
Notes on insects and insecticides.
Applications for the prevention of apple scab.
A study of the movements of soil water.
A description of varieties with classification, lists of synonyms and bibliography of various vegetables.

THE POTATO.

Under this head is reported:

1. A test of varieties.
2. Test with seed tubers selected from the most productive, and least productive hills.
3. Cuttings *versus* whole tubers of the same weight.
4. Fresh *versus* partially dried cuttings.

A Test of Varieties.

Twenty-six varieties or seedlings of the potato, of which the names and yields are given in the table on the following page, were grown the past season for the first time. Succeeding this table is a more elaborate one showing the result of a comparative test of seed tubers taken from productive and unproductive hills. This table serves equally well as a test of the varieties grown in 1886, of which it offers the results of two to four duplicate plantings of each, the four columns immediately succeeding the name showing the yield from the largest tuber of the most productive hill produced by each variety in 1886. The seed used in all was single eyes, planted April 26 to 28, in rows three and a half feet apart, the eyes placed one foot apart in the row. The soil, a fertile clay loam, received a good dressing of stable manure, which was applied and plowed in in the fall previous, and just before planting, was plowed very shallow, so as not to raise the manure to the surface. All after cultivation was done by hand. The season proved very dry until about midsummer, when abundant rains fell. In consequence, the potatoes made a slow and stunted growth through May and June, and some varieties matured before the drought was relieved. After the rains of July, those still alive commenced a vigorous second growth, that was checked in many cases only by frosts in October. On this account, the date of dying of the tops of the dif-

* E. S. Goff.

ferent varieties is not noted, and in order to simplify the table as far as possible, the data heretofore given of the time of vegetation, bloom, etc., though noted as usual, is omitted. The crop was harvested October 15 to 18.

As in previous reports, the yields given in the table are calculated on the basis of 100 hills, or eyes. That is to say, the largest tuber of the Adirondack, of which six eyes were planted, would have produced 50 lbs. of merchantable tubers, had there been 100 eyes yielding at the same rate. This is done in order that all the plantings, in which the number of eyes used varied from four to twenty-eight, as well the plantings of different seasons, may be comparable with each other. The average yield, per hundred eyes, of the product of the largest tuber, in all the varieties, was 164 merchantable tubers, weighing 62 lbs. 1¾ oz., or a total yield of 701 tubers, weighing 98 lbs. 1½ oz. Calculated per acre, allowing every eye to have grown, and 60 lbs. to the bushel, the average yield of merchantable potatoes would have been a fraction more than 129 bushels.

It appears that the Green Mountain yielded most, or a little more than 385 bushels of merchantable tubers per acre, and the Grange second, or about 310½ bushels per acre. In contrast with these, Brownell's No. 55, Buffalo Bill and Crane's Keeper yielded no merchantable tubers.

POTATO — A TEST OF VARIETIES.

NAME.	Number of merchantable tubers.	Weight of merchantable tubers.	Total number.	Total Weight.
		lbs. oz.		lbs. oz.
Brown Beauty	43	7 14¼	391	32 1
Canada Prince Albert	123	31 11¼	987	84 11¾
Crane's June Eating	78	21 12¾	645	65 1
Crane's Keeper	None.	....	414	30 11
Crown Jewel	59	15 5½	500	55 5¼
Dakota White	177	53 14½	1,241	128 4¾
Early Puritan, or No. 49	9	2 11¼	536	25 0
Hovey's Advance	36	10 4¾	286	31 3½
King's Excelsior	164	68 7½	745	124 8
Lake Erie	277	113 5¾	727	160 10½
Lombard	277	97 8¼	882	139 6¾
Morrell's Seedling	173	50 4½	845	109 12¾
Norway Mountain Rose	41	12 10¼	491	46 1½
Nye's Early Standard	91	26 10½	577	59 8¼
Perfect Peachblow	110	37 13¾	819	99 5¼
Polaris	77	19 9¾	395	44 14¼
Sibley's Monroe County Prize	273	142 9¾	659	173 12¾
Summit	209	80 9¾	905	139 9
Sunlit Star	191	44 13	759	90 5½
Sylvan	214	84 15	623	127 10
Tunxis	236	96 ¼	809	141 8¾
White Beauty	305	130 3	1,050	196 8¼
White Bermuda	218	85 4¾	945	133 6
White Flower	236	96 7¼	732	140 12¼
Yosemite	132	39 13½	814	98 4¾
"No. 49"	145	46 9½	736	101 6¾
Total	1886	704 9	7,373	1,168 7¼

NAME.	FROM THE MOST PRODUCTIVE HILL.								FROM THE LEAST PRODUCTIVE HILL.							
	LARGEST TUBER.				SMALLEST TUBER.				LARGEST TUBER.				SMALLEST TUBER.			
	Number merchantable.	Weight of merchantable.	Total number	Total weight.	Number merchantable.	Weight of merchantable.	Total number	Total weight.	Number merchantable.	Weight of merchantable.	Total number	Total weight.	Number merchantable.	Weight of merchantable.	Total number	Total weight.
		lbs. oz.		lbs. oz.		lbs. oz.		lbs. oz.		lbs. oz.		lbs. oz.		lbs. oz.		lbs. oz.
Adirondack	183	50 0	917	110 6½	150	59 6	1,117	147 6¾	None.	.....	444	36 1¾	.....	.....	.....	.....
Alexander's No. 103	208	129 12	581	159 8¾	300	172 10½	550	184 10¾	71	16 1¼	386	42 10¾	.....	.....	.....	.....
Alexander's Prolific																
Montreal	221	88 11½	1,371	172 7	288	147 9¾	1,367	187 12¼	144	49 5	1,222	129 8¼	.....	.....	.....	.....
American	257	85 7¾	1,243	138 13¼	237	90 3¼	612	112 4¾	289	106 12¼	733	137 13½	.....	.....	.....	.....
American Giant	225	86 14	855	139 6	250	100 10	800	141 9½	211	75 0	633	106 1¼	.....	.....	.....	.....
Andrus White Rose	236	127 13	654	130 14½	260	162 8	467	175 5	320	166 9	1,320	207 3	.....	.....	.....	.....
Arundel Rose	179	59 2½	607	90 4¼	256	103 2	937	141 ¼	254	90 15¾	854	139 1	.....	.....	.....	.....
Astonisher	200	73 14¾	669	118 15¾	157	66 1¼	371	82 9½	194	61 13	431	83 3¼	180	67 ½	520	93 14¼
Baker's Imperial	280	138 10¾	705	177 6¾	191	108 8½	445	134 8¾	188	67 7½	588	106 14¾	200	88 3	600	119 13¼
Baraboo White	33	7 7	248	21 15½	None.	.....	257	15 6½	None.	.....	367	11 15¾	None.	.....	266	9 6
Beauty of Hebron	50	12 ¾	736	47 14¾	67	24 2¼	367	47 3½	70	19 6	490	43 12	.....	.....	.....	.....
Big Benefit	119	19 14¼	509	37 3½	120	29 11	350	39 1	129	29 7½	614	38 13½	.....	.....	.....	.....
Bliss's No. 12	146	25 7¾	777	71 12	62	14 13½	612	50 6¾	14	3 12¾	514	31 14¾	None.	.....	350	20 13¼
Boston Market	67	16 9¼	561	48 8½	91	22 11¾	536	50 2¾	87	25 6¼	712	49 13	71	19 10¼	800	61 9¾
Breese's Red	235	108 13¾	625	147 9¼	275	123 13	925	179 11	.....	.....	.....	.....	.....	.....	.....	.....
Brownell's No. 55	None.	.....	367	30 11¾	300	131 1¾	1,400	200 6¼	None.	.....	525	38 7½	57	13 9¾	571	49 1¾
Buffalo Bill	None.	.....	220	8 13¾	.....	.....	.....	.....	71	17 13¾	379	42 13¾	.....	.....	.....	.....
Burbank	331	138 10	624	163 11	323	172 ..	577	198 5	282	157 13	609	183 10¾	.....	.....	.....	.....
Burpee's Empire State	284	123 4	740	161 6½	250	130 4¼	750	161 14¾	173	87 3½	936	123 9¼	243	104 ¼	1,200	157 3¾
Charles Downing	100	14 11	410	34 6	50	7 13	300	23 11¼	89	14 1	287	27 11¾	100	20 1½	300	31 ¼
Charter Oak	73	16 11¼	409	45 5	60	16 4	530	52 8	None.	.....	556	35 12¼	.....	.....	.....	.....
Chicago Market	158	46 1½	729	85 14	147	40 5	627	69 12¾	237	75 12½	636	102 8¾	.....	.....	.....	.....
Clark's No. 1	214	85 1¾	864	123 5¼	212	84 7½	587	104 11	111	60 12¾	622	105 ½	.....	.....	.....	.....
Conqueror	113	37 4¾	266	54 2¾	130	36 9	430	55 5	None.	.....	200	2 9¾	.....	.....	.....	.....
Corless Matchless	165	58 14¾	741	104 8	246	87 6	677	118 2¼	209	96 ¼	973	151 4½	250	48 14½	470	65 0
Crandall's Seedling	43	10 6¾	707	58 15	109	30 7½	782	73 2½	20	4 6	370	16 11½	.....	.....	.....	.....
Crane's Potentate	100	38 4½	540	80 ..	91	27 6¾	600	66 10	157	57 6	500	80 12¾	.....	.....	.....	.....
Dakota Red	286	97 3¼	721	139 10	.....	.....	.....	.....	60	17 ½	270	31 6½	266	160 15	522	188 14¼
Deflance	129	32 10¾	843	95 15¾	117	29 11	817	92 11½	133	44 12¾	1,133	186 7¼	.....	.....	.....	.....
Dunmore	292	112 1¾	642	142 13½	175	73 14¼	675	106 ¾	.....	.....	.....	.....	.....	.....	.....	.....
Early Albino	136	37 14¾	518	65 7¾	100	30 9	555	61 1¾	82	23 4¾	518	61 3½	.....	.....	.....	.....

Early Dawn	284	134	10	763	179	12¼	260	109	12¾	627	143	7	282	93	0¾	664	133	3¾	345	135	6	864	181	8½
Early Dunham	150	31	5½	606	56	5½	150	34	6	521	51	5½	137	43	12	662	71	1½	142	37	4½	1,129	73	7
Early Eclipse	276	85	4	892	127	11	186	83	4	543	113	13½	229	38	13½	729	55	12	None.	.....		240	14	1
Early Mayflower	111	35	12¼	722	75	0	160	38	7	560	73	7	87	17	9¼	425	43	9	80	24	11	940	69	1
Early Modena	262	99	12	1,269	173	12¾	233	92	11¼	1,133	165	5¾	133	44	8	955	101	11¾	67	22	2¼	700	80	11¾
Early New Zealand	112	36	5¼	369	53	2	80	20	3¼	367	40	3¼	44	8	8	255	24	7¾	.....	.....		.....	.....	
Early Ohio	50	13	12¼	362	37	11¼	14	5	8¾	429	33	14¾	None.	.....		500	29	4¾	.....	.....		.....	.....	
Early Rose	57	23	10½	507	59	6	29	10	15	1,186	45	8¾	111	31	12¼	422	61	10	80	19	11	700	69	1
Early Snowflake	73	22	0¼	1,055	78	15¾	86	21	10½	614	60	11½	112	31	13¼	612	63	13¾	50	10	15	900	45	5
Early Sunrise	133	42	11¼	992	99	7¾	131	39	6¾	631	88	15	100	32	3	1,050	84	8½	117	41	10¾	733	89	5¼
Early Telephone	150	55	13¾	725	97	13¾	125	45	8	750	69	8½	117	29	11	1,067	91	10¾	100	23	13¼	675	54	11
Early Vermont	280	110	11¾	833	157	3	200	81	8½	736	135	12¾	191	68	12	800	115	3	.....	.....		.....	.....	
English Champion	210	75	5	1,140	122	10½	78	22	6¼	678	66	2½	178	56	4	1,278	109	8¾	200	66	4	680	98	2
Farmers' Favorite	364	172	11¾	700	207	1¾	300	173	12	770	229	3½	None.	.....		400	19	14¾	.....	.....		.....	.....	
Finch's Early Perfect'n	224	90	8¾	733	126	0¾	225	95	14¼	737	148	0¾	173	61	8	900	101	6¾	136	51	0	800	105	6¼
First and Best	180	51	2	900	99	1	.....	.....		.....	.....		120	34	11	610	67	8	.....	.....		.....	.....	
Garnet Chili	133	53	6¼	683	91	14¾	100	4	11	400	5	12½	.....	.....		.....	.....		.....	.....		.....	.....	
General Logan	308	150	2	1,575	205	5½	250	137	8	737	167	6	300	39	11	740	74	11	.....	.....		.....	.....	
General McClellan	227	93	12	800	132	13	243	88	15¼	650	114	8	125	39	4	312	46	1½	.....	.....		.....	.....	
Giant Osceola	243	76	1¾	643	102	14½	157	42	4¾	571	72	5¼	186	65	0	614	95	12	.....	.....		.....	.....	
Grange	300	174	3½	1,186	223	7	312	190	10	1,237	247	10½	245	139	15½	1,409	207	13	217	98	11¼	883	134	6
Green Mountain	341	185	6¼	835	227	15	340	190	12½	750	230	15	300	162	8	500	181	6¾	312	162	11	1,237	226	5¾
Gypsy	136	58	8¼	327	79	13¼	190	92	0½	470	117	10½	83	37	12¼	583	68	7¾	.....	.....		.....	.....	
Hampden Beauty	164	53	2	693	92	10¼	129	33	11¾	829	71	6¾	122	29	5½	456	52	4¼	.....	.....		.....	.....	
Intermediate	27	6	13	582	35	3¾	.....	.....		.....	.....		10	3	7	250	19	3½	.....	.....		.....	.....	
Invincible	255	117	3	609	143	7½	200	91	10¾	500	117	3	150	66	12¾	1,000	125	0	.....	.....		.....	.....	
James G. Blaine	106	33	9½	669	75	14	109	31	15½	855	70	11¾	173	55	8½	845	92	3	86	22	5¼	571	50	10¾
James Vick	264	118	6¾	714	160	0¾	273	133	6	691	173	13¾	170	68	14½	680	121	1½	300	128	6¼	733	163	0¼
Jumbo	153	53	7	627	88	10¼	85	22	13½	608	57	1½	111	45	5	667	88	3	.....	.....		.....	.....	
Keystone	269	121	10¼	1,062	179	3¼	273	124	0	673	160	6	200	92	6½	786	151	5½	200	73	2¾	933	106	4
Late Beauty of Hebron	286	41	15½	786	71	14	120	18	2	310	28	3	27	3	2	218	8	8¼	None.	.....		162	18	5¾
Late Strawberry	121	43	10¼	371	62	6¼	180	46	9	340	57	8	.....	.....		.....	.....		.....	.....		.....	.....	
Luxury	15	4	11	562	28	2	50	13	11	779	45	6¾	33	9	6	733	32	4¾	None.	.....		240	15	10
Magnum Bonum	162	49	6¾	625	92	12¼	162	58	8¼	575	87	8	83	21	5¾	366	43	7¾	.....	.....		.....	.....	
Mammoth Pearl	126	78	4	700	112	6	191	71	9½	482	102	6¾	240	148	7	660	170	5	.....	.....		.....	.....	
Marvel of Beauty	117	22	0	283	30	1¼	83	14	1	358	24	14	None.	.....		260	7	8	.....	.....		.....	.....	
Monitor	160	52	9¾	733	99	4¼	190	65	0	590	99	8½	282	101	15¾	527	124	0	200	58	13¾	489	79	13¾
Morning Star	233	90	11¼	679	130	6¾	218	74	11½	727	129	2	237	82	13	569	116	0¼	.....	.....		.....	.....	
Mountain Rose	71	10	4¼	271	19	3¼	None.	.....		117	5	11¾	None.	.....		187	10	8¾	None.	.....		200	12	2¼
New Champion	202	113	7	484	138	7	271	110	0¾	846	130	9¼	293	125	3½	486	147	8¾	200	84	3	412	109	12¼
New England Beauty	87	25	9½	500	65	0¾	129	34	9½	571	68	8½	None.	.....		183	8	1¼	.....	.....		.....	.....	
New Queen	153	48	13¾	573	80	15	131	35	13	585	51	14¾	114	37	11½	486	66	1¼	143	49	8¾	486	71	6¾
Nott's Victor	155	52	1	623	93	1¾	150	61	3¼	550	100	0½	156	51	9	511	83	5¼	120	35	5	560	59	1
"No. 88"	300	118	7	880	165	1¾	233	116	12¼	867	171	11¼	173	53	8¾	718	100	0	200	102	1¼	567	137	8
O. K. Mammoth	231	103	7¾	677	147	5¾	277	132	13	615	154	2½	180	89	1	500	109	6	.....	.....		.....	.....	
Oswego Wonder	209	85	15	591	118	0¾	190	106	11½	680	152	8	200	112	8	600	140	5¾	.....	.....		.....	.....	
Pearl of Savoy	106	33	3¾	575	75	1½	89	24	13¼	400	47	14¾	87	25	9½	825	58	9½	125	39	1	875	85	2½
Pecan	231	62	13¾	1,300	123	5	271	68	5¼	871	106	7½	211	71	11¼	1,200	145	10½	167	45	0¾	1,233	110	15
Pennsylvania Belle	179	66	11¾	657	101	14¼	122	40	10	400	63	3	210	88	4½	370	104	1	.....	.....		.....	.....	
Pride of America	30	7	5½	510	43	7	22	6	1¼	322	16	5	None.	.....		620	38	12	.....	.....		.....	.....	

NAME.	FROM THE MOST PRODUCTIVE HILL.								FROM THE LEAST PRODUCTIVE HILL.							
	LARGEST TUBER.				SMALLEST TUBER.				LARGEST TUBER.				SMALLEST TUBER.			
	Number Merchant'ble.	Weight of Merchant'ble.	Total number	Total weight.	Number Merchant'ble.	Weight of Merchant'ble.	Total number	Total weight.	Number Merchant'ble.	Weight of Merchant'ble.	Total number	Total weight.	Number Merchant'ble.	Weight of Merchant'ble.	Total number	Total weight.
		lbs. oz.		lbs. oz.		lbs. oz.		lbs. oz.		lbs. oz.		lbs. oz.		lbs. oz.		lbs. oz.
Putnam's Favorite	133	46 8½	1,189	130 3¼	150	48 9½	1,430	118 12	229	75 7¼	971	133 4	.....	.....	.....	.....
Rochester Favorite	242	118 14	725	174 2½	299	148 7	709	190 3¼	309	133 1½	918	187 14¾	327	140 12¼	736	170 14
Rocky Mountain Rose	75	20 12¾	512	50 7¾	50	15 14¼	583	58 5¼	67	14 13½	350	46 5¾	.....	.....	.....	.....
Rogers' No. 4	177	63 13¼	530	93 10	17	11 3¼	317	21 9¾	67	25 11	344	43 3¾	.....	.....	.....	.....
Rogers' No. 7	237	144 7	1,181	209 7½	400	166 0 ¼	2,025	242 9¼	322	129 5½	1,189	193 9¼	.....	.....	.....	.....
Rose's New Seedling	133	39 13½	1,017	94 4¼	114	37 15¼	700	81 ½	280	91 9	900	129 1	.....	.....	.....	.....
Rose's No. 74	205	87 3	880	132 1¾	236	89 10	709	124 11½	154	58 2¾	846	109 15½	.....	.....	.....	.....
Rose's "Wild" Potato	156	59 11½	628	101 4¾	100	45 10	520	81 9	.....	.....	.....	.....	.....	.....	.....	.....
Rosy Morn	165	37 6¾	1,040	95 7½	186	53 12¾	729	90 6½	.....	.....	.....	.....	.....	.....	.....	.....
Rubicund	50	15 6½	364	41 13	.....	.....	.....	.....	44	11 4½	444	35 6¾	.....	.....	.....	.....
Rural Blush	300	125 6¾	1,136	193 ½	.....	90 3¾	.....	139 4	383	183 13¾	1,058	238 10¾	260	155 7½	530	185 12½
Rural Buttercup	78	25 14	544	57 9¼	50	15 ½	412	45 2	40	10 5	300	29 6	.....	.....	.....	.....
Saint Patrick	173	62 4¼	612	105 12½	187	79 7¾	713	129 14¼	None	.....	328	12 10¾	.....	.....	.....	.....
Scottish Champion	57	13 9¾	329	36 ¾	36	8 6	418	36 8	55	14 14¾	345	36 8	.....	.....	.....	.....
Snow Queen	44	10 15	689	60 15	50	16 6½	600	54 7¾	None	.....	217	5 9	.....	.....	.....	.....
Steele's Red	20	4 12¾	247	15 13¼	None	.....	60	0 5	.....	.....	.....	.....	.....	.....	.....	.....
Thorburn	190	73 14½	615	109 12¼	64	26 0	382	60 1¼	55	16 7¾	473	51 0	100	27 11¾	500	62 14¼
Thunderbolt	294	84 0	1,465	232 2¾	233	111 3¼	1,450	178 10¼	333	120 13¼	1,233	198 15¼	250	140 5¾	1,133	222 6¼
Tyrian Purple	140	44 6	830	109 3½	200	58 0½	771	106 4	None	.....	129	6 8¾	.....	.....	.....	.....
Vanguard	107	32 0½	671	75 7¼	130	46 4	500	77 15½	118	39 10	391	75 9	100	34 6	456	65 15½
Vermont Champion	20	5 0	190	21 11½	None	.....	180	11 14	.....	.....	.....	.....	.....	.....	.....	.....
Vick's Extra Early	286	139 10	729	182 7¾	200	85 6	543	129 14½	162	72 13¾	412	98 10	.....	.....	.....	.....
Vick's Prize	18	4 8¾	582	38 3½	67	8 5¼	400	22 6¼	33	6 15	456	33 13¾	12	5 10¾	387	34 9¼
Walls' Orange	227	78 5¼	560	117 4¾	222	67 5¾	555	108 2½	211	88 0¼	589	129 0	.....	.....	.....	.....
Webb's Early	27	3 5¼	387	18 2	81	9 15½	381	22 2¾	56	15 15	433	47 6¼	57	16 15½	571	54 3¾
White Elephant	327	161 15¾	1,040	221 15¾	150	88 4½	867	140 14¼	237	132 0½	1,025	199 3½	250	130 15	810	182 13
White Star	228	108 13¾	572	148 2¾	275	131 13½	562	164 7¼	300	146 2½	785	190 3¾	244	124 2	789	176 14½
White Whipple	238	97 15¼	615	136 2¾	178	63 3	689	113 14¼	120	63 12	660	106 9	.....	.....	.....	.....
"X X"	109	9 15	555	25 0	18	4 4¼	255	28 11	43	10 11½	614	51 12½	None	.....	480	32 8
Seedling:																
"Chance"	75	25 15¾	475	57 13	111	47 5¼	722	86 15¾	67	22 9¾	533	59 12¾	127	36 0¾	467	56 2¼
Robinson, No. 7	219	89 8¾	606	115 14¾	209	80 4	555	116 0¾	164	66 5¼	655	104 6½	.....	.....	.....	.....

Station No. 3.....	87	34 4½	506	76 5¾	86	28 12¾	214	38 3	143	44 12	407	68 15½	80	34 6	340	54 13½
Station No. 8.....	173	60 12¾	745	114 12¼	200	73 12½	700	124 13¼	200	62 8	657	101 1¾	100	37 8	700	83 11¼
Station No. 11.....	178	85 7¾	600	123 7	155	78 15¾	236	103 13¼	145	61 1¼	564	106 13	200	69 12½	444	92 14
Station No. 12.....	100	35 10¾	683	88 4½	133	46 1½	733	100 0	129	46 6¾	614	88 13½	75	25 12½	525	60 15
YIELDS CALCULATED ON THE BASIS OF 100 EYES:																
Average of 41 varieties, or seedlings, of which 4 tubers were planted	180	72 11¾	757	117 11	173	71 8¼	666	106 15½	166	64 2	694	104 11¼	160	61 1½	704	98 12
Average of 42 varieties, or seedlings, of which 3 tubers were planted	183	73 1¾	735	112 0¼	177	72 2¼	664	106 8½	163	62 11	635	97 15¾	.....	.....	.....	.....
Average of 9 varieties grown in 1884	.....	83.4	.....	106 0	.....	69 0	.....	88 0	.....	66 0	.....	85 0	.....	45 0	.....	69 0
YIELDS CALCULATED PER EYE IN OUNCES:		oz.		oz.		oz.		oz.		oz.		oz.		oz.		oz.
Average of 2 varieties grown in 1886	.....	11.43	.....	11.57	.....	15.85	.....	13.06	.....	13.51	.....	14.30	.....	4.14	.....	4.36
Average of 10 plantings, (9 varieties) grown in 1885	.....	17.24	.....	23.08	.....	16.77	.....	21.92	.....	15.53	.....	20.45	.....	11.67	.....	17.07

TESTS WITH SEED TUBERS SELECTED FROM THE MOST PRODUCTIVE AND LEAST PRODUCTIVE HILLS.

Garden Tests.

In the year 1884 an experiment was commenced in the use of seed tubers selected with reference to the prolificacy of the hills that produced them, an experiment that has been continued up to the present season*. In this report is presented additional evidence upon the subject.

In the fall of 1886, the most productive and the least productive hill respectively, was selected from the yield of our entire list of varieties and seedlings of the potato, and last spring the largest and the smallest tuber from each of these selected hills, that contained more than one tuber, was cut to single eyes and planted by itself. In many cases the least productive hill contained but a single tuber. In others the smallest tuber was too small for cutting and was rejected, no tubers not large enough to make at least four single eye cuttings of fair size being planted.

In the preceding table is given the yields, calculated on the basis of 100 hills or eyes of 116 varieties and seedlings, and on the last page of this table is presented a summary, giving the average yield of all the varieties of which the conditions admit of comparison. Certain varieties produced no merchantable tubers in one or more of the plantings, while of others only two tubers were planted. Such irregular cases were not calculated in the averages.

The averages secured in previous trials in the same experiment, as published in the reports of 1884, 1885 and 1886, are also appended for comparison with those of the past season.

In considering the results of this experiment it should be remembered that the yields given are the yields per eye planted, and not per tuber planted. This eliminates in great measure the influence of size in the tubers, because the size of single eye cuttings bears no necessary relation to that of the tuber whence they come. In order to avoid confusion in the use of terms, the most productive hill is spoken of as A and the least productive hill as B.

From the averages given it appears that the largest tuber of A yielded most in every case; that the smallest tuber of the same yielded second; that the largest tuber of B yielded third, and the smallest tuber of the same, when such was planted, yielded least. This order, it will be observed, does not correspond with that of the size of the

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* See Reports New York Agricultural Experiment Station, 1884, pp. 301–305; 1885, pp. 204–207; 1886, pp. 150–151.

tubers, because the smallest tuber from A averaged decidedly smaller than the largest one from B.

If we lay aside the exact numerical values and consider the yields only in terms of greater or less, it appears from the table that the merchantable yield of the largest tuber of A exceeded that of the largest tuber of B in sixty-nine cases, while the reverse was true in but thirty-eight cases; also that the yield of the smallest tuber of A exceeded that from the largest tuber of B in sixty-six cases, while the reverse was true in but thirty-five cases.

Plat Trials.

In addition to the garden tests just noted, six of the main plats, containing one-tenth acre each, were devoted to this same line of experiment, a quantity of seed having been selected for this purpose from the best and poorest hills of 1886. In order to avoid, as far as possible, the errors due to variation of soil in adjoining plats, each alternate row of these plats was planted with one selection of seed, and the remaining rows with the selection intended for comparison.

The soil was well prepared, but no fertilizer of any kind was used. The variety of potato was White Star, planted in rows 4 feet apart, the tubers or cuttings placed 1½ feet apart, in furrows 2½ inches deep, and covered with 2 hoefuls of dirt, the hill stepped on by the coverer. The surface soil was rather dry at the time of planting, and but .04 inch of rain fell for about 20 days thereafter.

Plats B 6 and 7 were planted May 3, with the largest tubers from the best and poorest hills of 1886, cut to single eyes. The crop was harvested October 8, and the yields were as follows:

	LARGEST TUBERS FR'M THE MOST PRODUCTIVE HILLS.			LARGEST TUBERS FR'M THE LEAST PRODUCTIVE HILLS.	
	Merch., lbs.	Total, lbs.		Merch., lbs.	Total, lbs.
B 6, Row 1	65¼	71¼	Row 2	68½	76½
3	79	86	4	87¾	93¾
5	92	101¾	6	69	77½
7	70¾	81¾	8	68¼	76
Aggregate	307	340¾	Aggregate	293½	323¾
B 7, Row 1	53¼	63¼	Row 2	51	60¼
3	55	67¾	4	60¾	70¾
5	59½	60½	6	60½	67¼
7	73½	81¼	8	59½	62½
Aggregate	241¼	272¾	Aggregate	231	260¾
Aggregate for the two plats	548¼	613½	Aggregate for the two plats	525	584½

In view of the extreme and entirely unaccountable variability in the product of different rows planted with the same seed, and the indecisiveness which always attends the plat system, the question naturally arises whether or not the comparison of aggregates is just. The tubers selected from the best hills were somewhat larger than those from the poorest, and the results of past experiments would lead us to expect a somewhat greater yield from the larger tubers. On the whole the results are favorable rather than otherwise to the most productive hills.

Plats 8 and 9 were planted May 3, with the smallest tubers from the best and poorest hills of 1886, not cut. The crop was harvested October 12, with the following results:

	SMALL'ST TUBERS FR'M THE MOST PRODUCTIVE HILLS.			SMALL'ST TUBERS FR'M THE LEAST PRODUCTIVE HILLS.	
	Merch'ble, lbs.	Total, lbs.		Merch'ble, lbs.	Total, lbs.
B 8, Row 1	91	103¼	Row 2	74¼	86
3	95¼	105¾	4	81	91¼
5	116	130	6	78	88½
7	96	112	8	61	73½
Aggregate	398¼	451¾	Aggregate	294¼	339¼
B 9, Row 1	56¼	73¼	Row 2	80¾	94¾
3	108½	124¼	4	97	197¼
5	109¾	120½	6	89	95¾
7	85	93¾	8	79¼	87¼
Aggregate	359½	412	Aggregate	346¼	384½
Aggregate for the two plats	757¾	863¾	Aggregate for the two plats	640½	723¾

In this case the balance is decidedly more favorable to the most productive hills, especially in plat 8. The seed tubers from these hills were slightly larger on the average than those from the poorest, but I should not expect so great a difference in yield to come from this source alone.

In order to eliminate as far as possible the errors due to unequal size in the seed tubers, plats B 10 and 13 were planted May 3 with tubers from the best and poorest hills, of which the average weight was exactly the same. The required number of tubers was selected from the best hills of 1886, and weighed. The same number was then picked out from the poorest hills, and individual tubers were changed until the aggregate exactly equaled that of the selections from the best hills. The tubers were about the size of small hens' eggs, and were cut into halves from the stem to the terminal eye. B 10 was harvested October 12, and B 13 October 8. The yields were as follows:

	TUBERS FROM THE MOST PRODUCTIVE HILLS.			TUBERS FROM THE LEAST PRODUCTIVE HILLS.	
	Merch., lbs.	Total, lbs.		Merch., lbs.	Total, lbs.
B 10, Row 1	89¼	105¼	Row 2	87¼	104¼
3	97¾	119¾	4	117	136½
5	89½	108	6	80½	97½
7	82¾	102	8	83½	99¾
Aggregate	359¼	435	Aggregate	368¼	438
B 13, Row 1	132¼	146¾	Row 2	122½	139¼
3	140¼	155¼	4	131	151
5	130¼	149¾	6	119¼	136¼
7	123¾	139¼	8	114	134½
Aggregate	527	591	Aggregate	486¾	561
Aggregate for the two plats	886¼	1,026	Aggregate for the two plats	855	999

In B 10 the aggregate merchantable yield from the most productive hills is 9 lbs. less than that from the least productive, but in B 13 it exceeds the same by $40\frac{1}{4}$ lbs. The aggregate for the two plats shows an excess in favor of the most productive hills of $21\frac{1}{4}$ lbs. of merchantable, and 27 lbs. of total yield.

If we consider each two adjoining rows as one series, we have in the six plats twenty-four series, in each of which is one row planted with seed from the most productive and one from the least productive hills. Laying aside exact numerical values, and considering the yield only in terms of greater or less, which is about all that the plat system warrants, it appears that the merchantable yield of the row from the most productive hills exceeded in seventeen cases out of twenty-four.

From the data, it appears further that the greatest difference in the yields of any two rows planted with the same selection of seed was in the merchantable yields fifty-nine lbs.; in the total yields fifty lbs. The greatest difference in the yields of any two rows planted with different selections of seed was, merchantable fifty-five lbs., total fifty-six lbs. In other words, the differences in the yields of rows planted with the same selection of seed are on the average fully as great as in those planted with different selections. The plat trials therefore do not prove that the seed from the most productive hills was really more favorable to crop than that from the least productive hills. They do, however, give strong evidence in favor of the seed from the most productive hills.

When we consider the results of all the trials that have been made at the station in the use of seed tubers from productive and unpro-

ductive hills, reaching through the past four seasons, the evidence has been so uniformly in favor of the former that there can be no longer any doubt of the importance of this method of selecting seed. No computations intended to express the real increase in yield per acre that is likely to result from such selection are offered. It is sufficient if the experiment proves that this method of selecting seed tends to increased crop. It is reasonable to expect, though the trials do not prove it, that the gain in vigor would be cumulative — that is, that it would increase from year to year so long as the selection is practiced, or up to the limit of the variety. The results of this experiment at least offer hope that a remedy is available for the deterioration in productiveness of varieties of the potato.

CUTTINGS VERSUS WHOLE TUBERS OF THE SAME WEIGHT.

In the Station Report for 1886, pp. 151-153, is reported an experiment in the use of whole tubers, and cuttings of equal average weight, in which the yield appeared to favor the whole tubers. This experiment was repeated the last season on main plats B 14, 15 and 16. The first of these plats was planted in alternate rows with single eyes, and whole tubers of which the average weight was exactly the same as the cuttings. The second was planted with three eye cuttings and whole tubers of equal weight, and the third with half potatoes, and whole tubers of equal weight. The plats were planted May 3, and the crop was harvested October 7 and 8. The yields were as follows:

PLAT B 14.

	SINGLE EYES.		WHOLE TUBERS.	
	Merchantable	Total.	Merchantable	Total.
	96	108	78½	88
	102	112½	74¾	84¾
	98	113¼	79½	90¼
	74½	87¾	71¾	82½
Aggregate.....	370½	421½	304½	345½

PLAT B 15.

	83½	102	86	107¾
	83¾	102½	104¼	123¾
	103	124½	109¾	128½
	111½	126½	118¼	139¾
Aggregate.....	381¾	455½	418¼	499¾

PLAT B 16.

	106¼	128¼	111½	134½
	122¼	140½	127¾	151
	118	137	119¼	139
	107½	127¾	88¾	113¾
Aggregate.....	454	533½	447¼	538¼

The results are entirely non-committal. In plat 14, the cutting appeared favorable to the yield; in 15, the reverse was the case, while in 16, the yields are as nearly equal as could be expected in duplicate plantings.

FRESH VERSUS PARTIALLY DRIED CUTTINGS.

In the Station Report for 1886, page 153, is given the result of a test with fresh cuttings compared with those exposed to the air for eleven days before planting, which appeared to indicate that the partial drying proved favorable to the yield.

The past season this test was repeated on a more extended scale. Beginning on Saturday, April 3, and continuing until Monday, May 2, a given number of single eye cuttings from White Star potatoes of good merchantable size were made on each week-day morning, and after being weighed, were spread over the bottom of a small box, which was then placed on the floor of the office attached to the greenhouse. The temperature of this office ranged from about 60° to 80°

F., and the dryness of the air was tempered somewhat by moisture from the greenhouse.

On May 2, each lot of cuttings was again weighed, to determine the loss of moisture, after which ninety-nine from each were planted, with an equal number of fresh cuttings. The test was made in nine duplicate series, each containing twenty-six rows and eleven hills or eyes in each row. The first row in each series was planted with fresh cuttings, the second with cuttings that had been exposed two days, the third with those exposed three days and so on.*

In the following table, the aggregate yield of the nine series is given as one series, *i. e.*, the yields of the first row in all the series are added together to form row No 1 of the table, and so on.

The second column of the table shows the per cent of loss in weight from evaporation during the exposure of the cuttings. As appears, this percentage did not always increase in proportion to the length of the exposure. The third column shows the number of eyes that vegetated out of ninety-nine planted. The four columns succeeding the third give the actual yields, and the four to the right the yields calculated on the basis of 100 hills. At the latter end of the table, the data of each five rows of the series (the first contains six rows), are averaged as one row.

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*As no cuttings were made on the five Sundays that intervened between April 2 and May 2, the number of days drying did not always correspond with the number of the row, as appears from the table.

POTATO — CUTTINGS DRIED TO VARIOUS DEGREES.

	Number of days exposed.	Per cent of loss.	Number of eyes that vegetated.	Number of merchantable tubers	Weight of merchantable tubers	Total number of tubers.	Total weight of tubers.	Calculated on the Basis of 100 Hills.			
								Number merchantable.	Weight of merchantable.	Total number.	Total weight.
Row No. 1	.....	.....	94	253	117 8¼	552	148 5	269	125 0¼	587	157 12½
2	2	8	99	238	95 13¼	539	126 12¼	240	96 12¾	544	128 0¾
3	3	16.3	97	220	95 15¾	448	123 11½	227	98 12¾	462	127 8½
4	4	17.2	99	301	149 10½	626	188 0¼	304	151 2¾	632	189 14½
5	5	23.6	97	225	92 13¾	469	119 0¼	232	95 11¼	484	122 11¼
6	6	19.7	99	274	122 10¾	520	147 15½	280	123 15¾	525	149 6
7	7	24.9	98	259	110 10½	602	147 8	264	112 14¾	614	150 9
8	9	26	96	272	128 4½	554	156 4½	283	133 10	567	162 12¾
9	10	29.1	93	285	116 7½	.....	144 15½	306	125 3¾	.....	155 14
10	11	31.2	91	239	104 13¾	540	132 1¼	263	115 3¾	593	145 2¼
11	12	28.9	97	264	112 13	557	139 1¾	272	116 4¾	575	143 6½
12	13	32.2	98	233	97 7¾	538	127 15½	238	101 8½	549	130 9¼
13	14	33.3	95	240	99 8¼	542	131 13¾	263	104 11½	568	138 2¼
14	16	39.9	84	228	93 3½	546	120 11¾	271	110 15½	840	143 11
15	17	38.8	86	227	99 0	527	128 10½	264	115 1¾	613	144 15¼
16	18	39.3	80	229	101 1¾	497	124 5¼	286	126 6¼	621	155 6½
17	19	41.8	76	212	100 5	458	125 14	279	131 15¾	603	164 9¼
18	20	36.1	83	209	95 9½	488	125 0¼	252	115 2¾	588	150 10
19	21	51.1	58	193	93 0¼	418	114 1	333	160 6	721	196 10½
20	23	44	64	169	79 12¾	407	99 15½	264	124 11	636	156 3¼
21	24	49	53	190	101 10	408	119 13¼	358	191 12	751	213 15¾
22	25	44.3	66	224	115 13½	475	142 12¼	340	175 8¼	705	216 5
23	26	47.8	60	181	89 2¼	365	108 9¼	302	148 9	608	180 15½
24	27	45.6	56	167	73 11¼	339	90 6¾	298	131 9¾	605	161 7½
25	28	52.6	53	149	69 7½	297	84 11½	281	131 1	560	159 13½
26	30	38.4	58	190	83 9¾	385	100 2¼	328	144 2½	664	172 10½
Average of rows Nos. 1- 6	3.3	14.13	97.5	252	112 6¾	525.67	142 4¾	259	115 7¼	539	145 14¼
7-11	9.8	28.02	95	263.8	114 9¾	560.75	143 15¾	278	120 10¾	587	151 9
11-16	15.6	36.4	88.6	231.5	98 7½	530	126 11¼	264	111 11¾	638	142 8¾
17-21	21.4	48.7	66.8	194.6	94 1	435.8	116 15¼	297	144 12¾	660	176 6½
22-26	27.2	45.74	58.6	182.5	86 5¾	372.2	125 5¼	310	146 3	628	178 4

As appears from the table, more conspicuously from the averages at the latter end of it, both the proportion of vegetation and the yields decreased in the main, as the drying of the cuttings increased. The yields of rows Nos. 6 to 10, however, of which the mean time of exposure was 8.6 days, and the mean loss 26.18 per cent, averaged slightly larger than those of Nos. 1 to 5. Nor did the proportion of vegetation appear to decrease until the cuttings had been exposed more than nine days and had lost twenty-five per cent of their weight. The yield calculated per hundred hills increased with the dryness of the cuttings, but this is quite as likely due to the increased room given the plants by the smaller vegetation of the dried cuttings as to greater vigor from the result of the drying. The cuttings were planted one foot apart in rows three feet apart.

As has already been mentioned, the early part of the season was exceptionally dry, less than two and a half inches of rain having fallen between May 1 and the first week in July.

The deductions from this experiment are, obviously, that exposing cuttings to the air of a moderately dry room for a week or ten days before planting is neither detrimental to their vegetation nor productiveness, while the tendency may be toward a slight increase in yield. A longer exposure than ten days, however, is injurious.

EXPERIMENTS IN ROOT GROWTH.

Under this head is reported:

1. A study of the development of young corn roots, with especial reference to the effects upon them of early cultivation.

2. An experiment intended to throw light upon the question whether cutting the roots of young corn plants is favorable or unfavorable to crop.

3. An experiment intended to show whether the location of roots in the soil is governed more by temperature or fertility.

THE GROWTH OF YOUNG CORN ROOTS.

On May 30, the roots of five corn plants, of which the seed had been planted eighteen days previously, were washed out and examined. The soil was a rich clay loam, and the average height, in the plants examined, of the tip of the tallest leaves raised erect, was ten and three fourths inches. The seed kernels, which were still intact, were two to two and a half inches below the surface.

The longest root, and especially the one that had made the largest development of fibers, in each of the plants examined, was the radicle or the root that starts at the base of the kernel. This did not in any case grow directly downward, but inclined at an angle of somewhat

less than 45°, and its length varied in the different plants from seven to ten inches. It was in every case densely clothed with fibrous branches, some of which had already attained the length of eight or nine inches. On one root sixty of these branches were counted in the first inch below the kernel, and the number did not appear to decrease for a distance of eight inches. These branchlets averaged about three inches in length, from which it appears that the length of the fibrous roots, in a corn plant but eighteen days from planting, may easily aggregate more than 100 feet.

The roots that started out at the first node of the stem were rather numerous, and a few of them had attained the length of eight inches. These roots were, at this time, almost destitute of fibers, and probably did the plant little good. They grew nearly horizontal, and at no part of their length were more than three inches below the surface, while many were not deeper than two inches.

The Effect of Early Cultivation Upon Corn Roots.

The spade was inserted to the depth of three inches on four sides of several hills of corn, keeping about three inches from the stems, after which the earth was washed away from the roots of one hill. It appeared that twelve roots had been severed, some of which were radicles. Had the spade been inserted to the depth of four inches, it would probably have severed as many more.

The average corn cultivator, passing between rows of corn, the teeth reaching to the depth of three inches and within an equal distance of the plants, would probably not sever as many roots as did the spade in this trial, but it would necessarily displace, or at least disturb, all that lay within three inches of the surface.

On June 6 the roots of two other hills of corn, one of which had been root-pruned a week previous, were washed out and examined.

In the hill not root-pruned, the longer roots had attained a length of twelve to eighteen inches, and the longer nodal roots were becoming clothed with fibers near the base. The radicle had increased in length about in proportion to the other roots, and its fibers had also grown much.

An examination of one of the hills root-pruned a week previous brought out the following facts:

1. Although considerable rain (.13 inch) had fallen during the week, the pruning had apparently proved a serious check to the root development.

2. The root-pruning had stimulated the growth of fibers on the nodal roots.

3. The number of nodal roots was not perceptibly increased by the pruning.

In all the plants of the root-pruned hill, three in number, the radicle had been cut; in two of them two nodal roots had been cut, and in the other, three.

On June 13, one week later, a further examination was made. Very little rain had fallen since the last examination, and the surface soil was now becoming decidedly dry. A marked root growth, however, had taken place. The growth consisted of an increase in number and a decided increase in the length of the main roots, but especially in the development of fibers on the roots that start at the first node of the stem. The longer roots now reached horizontally a distance of two feet, so that those of adjoining hills intermingled somewhat, and many had grown downward to the depth of a foot or more.

The height of the plant, to the tip of the tallest leaf raised erect, in the plants examined, was thirty inches in the root-pruned hill, and about an inch less in the hill not root-pruned. The effect of the root-pruning was scarcely perceptible in the part of the plant above ground, but it was quite noticeable in the roots. The fibers were much more concentrated within the space circumscribed by the pruning tool, and the number of main roots that reached more than three or four inches from the plant was decidedly fewer in the root-pruned plant than in the other, while the longest roots were evidently those that had escaped the cutting. One root eight inches long had evidently grown out since the root pruning. In the plant not root-pruned the roots and fibers were more evenly distributed through the soil.

In the four root-pruned plants examined, the number of main roots was fifty-five, while it was sixty in the four not root-pruned, thus indicating that the root-pruning did not stimulate the production of main roots.

On June 28, a fourth examination was made. The effects of the root-pruning were still noticeable, the root growth near the plant being decidedly more concentrated in the root-pruned hill. The whole amount of root-growth appeared as great as, if not greater in the latter, than in the one not root-pruned. The fibers not only appeared more numerous, but they were larger and more sub-divided. A root from the pruned hill that was cut off in the pruning, and was five inches in length, had put out 180 fibers, while one of the same size and length in the other hill had put out but 111. This, however, only illustrates a part of the differences that actually existed, for the fibers in the root-pruned hill were much more developed than in the other.

The roots of potatoes appeared to be less affected by root-pruning than those of corn, and the difference seemed due to two facts, viz.: The cutting appeared to check the root growth less, and a larger proportion of the roots grew too deep to be reached by a pruning tool inserted at the depth of three inches.

It should be added that the above observations were made on plants growing on soil in a good state of cultivation, and abundantly supplied with plant food.

Is Cutting the Roots of Young Corn Plants Favorable or Unfavorable to Crop?

Passing a cultivator between the rows of growing corn, in the manner usually practiced by the farmer, accomplishes two quite different results, viz., it breaks up the capillary connection between the surface and deeper layers, and thus reduces evaporation from the soil, and it also destroys a larger or smaller proportion of the root development. The first of these effects is unquestionably beneficial. Is the second, in itself, beneficial or injurious?

In order to throw light upon this question, main plat G 10, containing one-twentieth of an acre, was planted with corn May 13. The soil had been well prepared, but was not in a good state of fertility, and no fertilizer was applied. The plan was to eliminate entirely the influence of stirring the surface soil, by withholding all cultivation, and to root-prune the plants of each alternate row to, as nearly as possible, the same extent as would be accomplished by the average corn cultivator, at the same time stirring the soil as little as possible. The weeds were removed from the whole plat by hand.

On June 6, when the young corn plants had attained the height of three to six inches, a lawn-edger was inserted to the depth of three inches on the four sides of each hill in every alternate row, keeping the tool three to four inches from the plants. Considerable rain (.76 inch) had fallen during the week previous, and the soil was abundantly moist. The plat was not again disturbed, except to pull a few weeds that appeared, until June 24, by which time the plants had attained about the size when they are usually cultivated the second time. A second root-pruning was now given, on the same rows, and in the same manner as the first. The soil was not very dry at this time, as 1.25 inches of rain had fallen within a week previous, .09 inch of which fell on the morning of the 24th. No further attention was given to the plat except to pull the weeds as they grew sufficiently large to require it.

The corn was not cut until all growth had ceased. On October 1,

the stalks, with the ears intact, of each row were weighed, after which the ears were husked, assorted and weighed, with the following result:

CORN — THE INFLUENCE OF ROOT-PRUNING THE YOUNG PLANTS.

ROOT-PRUNED.						NOT ROOT-PRUNED.					
	Weight of stalks with ears.	Number of merchantable ears.	Weight of merchantable ears.	Total number of ears.	Total weight.		Weight of stalks with ears.	Number of merchantable ears.	Weight of merchantable ears.	Total number of ears.	Total weight.
No. of Row.	lbs.		lbs.		lbs.	No. of Row.	lbs.		lbs.		lbs.
1	38½	42	13½	80	19½	2	55¾	64	26	90	29½
3	42	45	15½	86	22	4	50½	55	21	79	25½
5	41	32	13	78	20	6	55¾	56	22½	95	28
7	43	48	17¾	83	23¼	8	53¼	64	24½	90	29
9	36¼	37	12	81	17½						
Average ..	40⅛	$40\frac{4}{5}$	$14\frac{7}{20}$	$81\frac{3}{5}$	$20\frac{9}{20}$	Average ..	$53\frac{13}{16}$	59¾	23½	88½	28

From the table it is strikingly evident that the root-pruning in this case was injurious. If we calculate the product of merchantable corn per acre from the average yields, allowing eighty pounds of the freshly husked ears to represent a shelled bushel, it appears that the root-pruned portion yielded at the rate of thirty-two bushels and twenty-three pounds, and the portion not root-pruned at the rate of fifty-two bushels and seventy pounds; in other words, the root-pruning, as performed, made the difference between a poor and a good crop. The season, on the whole, from the time the corn was planted until the end of the first week in July, proved exceptionally dry. It should be remembered, however, that the pruning was performed at times when the soil was not in a dry condition.

Too much stress must not be placed upon the result of a single trial, but the outcome of this experiment is certainly suggestive.

IS THE LOCATION OF ROOTS IN THE SOIL GOVERNED MORE BY TEMPERATURE OR FERTILITY?

In 1886, several different garden plants were grown in three-inch drain tiles, set full length in the soil, in a vertical position, with the bottom open, and the space within filled with fertile soil.* It was observed that in every case where the plant made a good growth, the roots had penetrated through the tile to the bottom, after which they turned upward, growing in this direction until they reached the fertile layer of soil near the surface, when they changed their direction again,

* See Report New York Agricultural Experiment Station, 1886, p. 167.

and extended horizontally. What induced the roots to grow in this manner? Evidently they did not grow upward in search of moisture. The soil was warmer and more fertile near the surface than near the bottom of the tile, and it was undoubtedly one of these inducements that attracted them upward. Had abundant nourishment been supplied at the base of the tile, and the roots were still found to have grown upward, the inference would be warrantable that they were attracted upward by warmth.

In the spring of 1887, four pits were dug, each three feet in diameter and three feet deep. Two of these were filled to the top with fertile soil, mixed with compost; the other two were filled with the same to the depth of two feet, and finished to the top with the clay that had been taken from the bottom of the pits. In the center of two of these pits, one of which was filled to the top with fertile soil, and the other finished at the top with clay, two four-inch sole tiles were placed erect, one resting on the other, so that a tube was formed to the depth of twenty-eight inches. In each of the other two pits, one tile was placed, making a tube in the center fourteen inches deep. The tiles were then filled to the top with fertile soil, tamped in lightly to ensure a continuous column. Thus prepared, we had abundant fertile soil at the bottom of all the pits, while in two, the surface soil was a very infertile clay.

In each of the two pits containing the single length of tile, a few kernels of Waushakum corn were planted in the soil within the tile, while in the tiles of the other pits, seeds of the Student parsnip were planted. These plants were chosen because the corn is known to root shallow, and the parsnip deep. After the seeds had vegetated, the young plants were thinned to one for each pit. The corn plants made an excellent growth, and each produced several stalks. The one in the pit topped out with clay yielded three merchantable ears and five nubbins, and the other, three merchantable ears and two nubbins. The parsnip plants were a fair growth.

On September twenty-four, the roots of the corn plants were washed out and examined. In neither the pit filled to the surface with fertile soil, nor in the one topped out with clay did the roots incline upward to any extent. The appearance was the same as if the bottom of the tile corresponded to the surface of the soil. The roots were very much as in their natural position, extending in every direction except upward. A few fibers reached upward in both pits, but no more than in corn roots growing under ordinary conditions.

On September 29, the roots of the parsnip plants were examined in the same manner. Very few roots had penetrated to the

bottom of the second tile, and these grew outward, inclining down. But in both plants, roots had grown out at the junction of the two tiles. In the pit filled to the surface with rich soil, these roots unquestionably inclined upward, some of the fibers reaching almost to the surface. In the other pit, where the junction of the tiles was about at the union of the fertile soil and clay, one large root came out and turned at once downward into the rich soil; another inclined downward, but descended gradually; a third grew straight outward, and some of its fibrous branches descended, while as many more ascended.

That the roots of the parsnip, a plant that thrives in cool climates, and roots very deeply, should have inclined upward more than those of corn, a shallow rooting, tropical plant, was hardly to be expected. The parsnip plants, however, did not make full development, while those of the corn made an unusually strong growth. Leaving out the parsnip case, which is perplexing, the fact that the corn roots made their full development more than a foot below the surface, while the greater part are usually found within the first four inches of soil, and while there was nothing to prevent them from rising to the warmer soil above, is evidence that abundant food and moisture are more essential to the development of corn than a high soil temperature.

In order to make sure that the roots of corn plants, growing under ordinary conditions, lay no deeper in the soil than usual the past season, the roots of plants were washed out and examined. They were found to be, as in former seasons, chiefly within two to five inches of the surface.

INSECTS AND INSECTICIDES.

1. Nitrate of potash and air-slacked lime for the cabbage maggot.
2. Applications for the larvæ of the potato beetle.
3. Applications for the codling moth.

NITRATE OF POTASH FOR THE CABBAGE MAGGOT.

By request of Dr. Lintner, State Entomologist, an experiment was made with a solution of nitrate of potash (saltpeter) for the cabbage maggot (larvæ of *Anthomyia brassicæ,* Bouche).

On the first indication that the cabbage plants were infested with this insect, which was on May 31, a solution of saltpeter, at the rate of one pound to two gallons of water, was applied to alternate rows of a plat of cabbage plants. The application, which was repeated on June 4, 10 and 16, was made by pouring one to two gills of the solution around the stem of each plant, from a sprinkling pot, from which the rose was removed.

On June 18, an examination was made of all the plants in four rows of the plat, fifty-five in number, with the following results:

Twenty-nine treated plants were attacked by 124 maggots.
Twenty-six not treated were attacked by 25 maggots.

One of the treated rows was on the outside of the plat, and it was observed that the plants in the outside rows, and at the ends of the inside rows were more infested than the others. The greater number of maggots found in the treated rows is to be ascribed to this fact, and not to an assumption that the nitrate of potash attracted the cabbage fly.

The last application was made but two days before the examination, but many live larvæ, that had apparently just hatched, were found in the treated rows, thus showing that the solution was harmless to the insects. As an additional test, a cabbage plant badly infested with maggots was placed in a flower-pot, and treated repeatedly with a saturated solution of the salt, but no effect upon the insects was observable.

Air-Slacked Lime for the Cabbage Maggot.

It has been claimed that lime placed about the roots of young cabbage plants will prevent injury from this insect. As an experiment, a quantity of air-slacked lime was mixed with the soil of two rows of a small plat of early cabbages at the time of setting the plants. As the season for the attack arrived it appeared that the plants of the plat were all suffering, and an examination made June 18, showed that twelve plants treated with the lime had sixty-six maggots, while eleven plants not treated had but twenty-four maggots, proving conclusively the ineffectiveness of the application.

Applications for the Larvæ of the Potato Beetle.

1. *Paris green.*

In previous years we have sought to determine the minimum amount of Paris green, mixed with land plaster, that proves effective in destroying the larvæ of the potato beetle, *Doryphora* 10-*lineata*, Say. Several experiments indicated that one part of the poison to 150 of the plaster is sufficient when the two are thoroughly mixed.

Some potato growers, however, prefer to use water as a diluent for the poison. For the benefit of such, the attempt was made to discover the minimum amount of the latter that proves effective when used in this way.

One-fourth of an ounce of Paris green, mixed with five gallons of

water, applied to the tops of a plat of potatoes on July 7, destroyed a portion, but not all, of the larvæ. Doubling the amount of the poison, however, the application proved almost entirely effective.

2. *London purple.*

This poison, used at the same rates as the Paris green, proved about equally effective. As it is considerably cheaper than the latter, the cost of the application is somewhat less, but as so little of the poison is used in either case, the difference in the expense is slight.

3. *Zoektein poison.*

An insecticide, bearing the above name, was received from the "Zoektein Company," of Albany, with the request to try it for various insects. It is a pale yellow powder, partially soluble in water, and was found, on test, to be an arsenite. On July 7, it was tested for the potato beetle larvæ, at the rate of one-fourth of an ounce to five gallons of water, and was found to be more effective than either Paris green or London purple, at the same rate of dilution. On doubling the proportion of the poison, the destruction of the insects was complete, while no apparent injury to the foliage followed. The exact composition of this insecticide, and the price at which it is sold, were not stated by the party sending it.

A trial of the same for the coddling moth is reported farther on.

4. *Rose's Tobacco Soap.*

This insecticide, though found effective for destroying insects in the green-house, had no effect on the larvæ of the potato beetle.

APPLICATIONS FOR THE CODLING MOTH.

1. *McDougall's Sheep Dip.*

A package bearing the above name was sent to the station by E. Jerome Woodford, West Candor, N. Y., with the request that it be tested for insects infesting fruit trees. It is a dark brown liquor, having a powerful odor resembling that of coal tar, and appeared very similar to, if not identical with, a preparation received from another source in 1884 under the name of Little's Soluble Phenyle. It is very readily soluble in water, forming a milky white solution. It is not claimed to be an active poison, and its value as an insecticide, if any, lies in its slight caustic properties and its powerful odor.

A thorough test was made with this preparation for the codling moth, in order to discover if this insect might not be repelled by its odor. If such proved to be the case, it would have the advantage over Paris green in being practically non-poisonous; hence no injury

could follow either from the fruit, or the crop growing beneath the trees.

On May 25, seven Rhode Island Greening apple trees were sprayed with solutions of this preparation, in three different degrees of strength, and the applications were repeated at the same rates on May 30. The fruits from these trees, and also from two check trees in the immediate vicinity not sprayed, were examined on October 7, from which it appeared that in 2,254 apples from the sprayed trees the per cent injured by the codling moth was almost exactly the same as in 1,408 apples from the check trees; in other words, the applications were entirely unavailing for the purpose intended.

2. *The Zoektein Poison.*

On June 4, three trees of the Rhode Island Greening apple were sprayed with the above at the rate of one ounce to ten gallons of water. Very little rain fell thereafter until June, by which time it was so late that the application was not repeated.

On October 7, 1,244 apples from the treated trees were examined, of which 421, or about thirty-four per cent, had been injured by the codling moth. On the same day 746 apples were examined, from a check tree in the immediate vicinity, of which 358, or about forty-eight per cent had been injured by the same insect. As the latter percentage corresponds closely with that of the check trees in the preceding experiment, it is inferred that the application saved about fourteen per cent of the apples from injury. Had the trees been sprayed earlier, the benefit would probably have been greater, but as the insecticide did not reach the station until June 1, this was hardly possible.

It should be added that at the rate used, the foliage was slightly injured.

APPLICATIONS FOR THE PREVENTION OF APPLE SCAB.

1. *Hyposulphite of Soda.*

During the years 1885 and 1886* trials were made with hyposulphite of soda as a preventive of the disease known as scab in the apple, and due to a fungus named *Fusicladium dendriticum*, Fckl. In the latter year the experiment was extended to a pear tree known to be much infested with an allied species of *Fusicladium*. All of these applications appeared to prevent a part of the injury.

The past season the trials have been repeated on a more extended

*See Reports New York Agricultural Experiment Station, 1885, pp. 231–2; 1886, pp. 177–8.

scale, so as to embrace the crab tree, treated in preceding years with seven trees of the Fall Pippin variety.

One-half of all the trees was sprayed with the solution, leaving the other half untreated. Different trees of the same variety vary so much in the amount of the fungus that infests them, that the method adopted in the experiments for the codling moth, that of spraying one tree and leaving the next unsprayed, as a check, is hardly available.

The crab tree, which was of the Siberian variety, was sprayed five times, viz., on May seventh, sixteenth, twenty-fifth, thirtieth and June twenty-eighth. The first of these applications was at the rate of one pound of the hyposulphite to twenty gallons of water, the remainder at the rate of one pound to ten gallons. The tree was sprayed on the part not sprayed in previous years.

The Fall Pippin trees were also sprayed five times, viz., on May eleventh, twenty-first, twenty-fifth, thirtieth and August twenty-second, the solution in every case being at the rate of one pound to ten gallons.

On August twenty-fifth a quantity of fruit was picked from the sprayed and from the unsprayed part of the crab tree, and assorted into three qualities. In the first quality were put only fruits free from scab; in the second those slightly attacked, but not sufficiently to injure their market value, and in the third those much injured. The results were as follows:

	No. of fruits examined.	Per cent in first quality.	Per cent in second quality.	Per cent in third quality.
Sprayed part	662	87.9	11.2	.9
Unsprayed part	749	71.8	25.5	2.7

September fifth, a quantity of fruit was picked from the sprayed and unsprayed parts of the Fall Pippin trees and assorted into three qualities, as above noted, with the following result:

	No. of fruits examined.	Per cent in first quality.	Per cent in second quality.	Per cent in third quality.
Sprayed part	1,068	59.1	36.1	4.8
Unsprayed part	1,120	41.8	46.6	11.6

It appears that in both the crab tree and the Fall Pippin tree, the percentage of fruits in the first quality was greater in the sprayed portion, the difference amounting to about sixteen per cent in the former and about eighteen per cent in the latter. In the second and

third qualities, on the other hand, the percentage is greater in the part of the trees not sprayed.

It seems probable that in orchards badly affected with the scab, the damage might be sufficiently lessened by the use of hyposulphite of soda to abundantly pay the slight cost of the applications. In cases where trees are to be sprayed for the codling moth, the salt could be dissolved in the same water that contains the poisoning material used, and thus the cost of a special application might be saved. Hyposulphite of soda is a white, crystalline salt, very readily soluble in water, and is not poisonous. It may be purchased at the ordinary village drug store at from six to ten cents per pound, and if ordered in larger quantities from a wholesale house, could be had correspondingly less.

2. *The "Audoynaud Process."*

Two of the formulæ that have been recommended by the Department of Agriculture for the treatment of the downy mildew and black rot of the grape, are also recommended as being possible preventives of the apple scab. One of these, viz., No. 2, of the third circular of the Section of Vegetable Pathology, was tested at the station. It consists of one pound of sulphate of copper, dissolved in three or four gallons of warm water, to which is added when cool, one pint of commercial ammonia, when the whole is diluted with water to twenty-two gallons.

It was found that at the strength noted, the liquid was too strong for the foliage of apple trees. Where one application was made, the leaves showed decided injurious effects, and where three were made the damage was correspondingly greater. The trees not being under normal conditions of growth, no estimate of the effect upon the fungus was made. Indeed, in the trees treated three times, the larger part of the fruits, in the sprayed part, fell off before maturity.

A STUDY OF THE MOVEMENTS OF SOIL WATER.

Under this head is reported:

1. The influence of atmospheric pressure upon percolation.
2. Experiments on capillary action in soils.
3. Progress in measuring the soil moisture.
4. A new lysimeter.
5. The height of water in wells.

THE INFLUENCE OF ATMOSPHERIC PRESSURE UPON PERCOLATION.

In an experiment made in the year 1885, planned for the purpose of studying the influence of stirring the surface soil upon drainage, it was observed incidentally that the flow of water was much greater on some days than on others; and on comparing the amount of flow with the barometric changes, a rather marked correspondence could be traced. It appeared that increased drainage accompanied a fall in the barometer, and *vice-versa*. This observation suggested the following series of experiments in December, 1886.

In the first trial, a five-inch "deep" flower pot was filled with clay soil, and after being submerged eighteen hours in a water tank to secure saturation, was placed upon a wire stand, within the receiver of an air-pump. When dripping from the soil had ceased, a part of the air was exhausted from the receiver, when the flow immediately recommenced, and when this had ceased, another part of the air was exhausted, when drainage again commenced. A third trial was accompanied with a like result.

The next trial was designed to show whether the dripping was due to a certain degree of exhaustion of the air, or was only the result of a change in atmospheric pressure. The air was admitted to the receiver, and a column of mercury connected with the latter so that the degree of exhaustion could be measured. The air was then rarefied until the water began to drip freely from the pot of soil. When this drainage had ceased, the air was let into the receiver once more, and after an interval, exhausted to the same degree as before. The dripping again commenced, and the test was repeated with the same result, indicating that the percolation was due to a change from a heavier to a lighter air pressure, rather than to the reduction of the air pressure to a given limit.

On considering the cause for these phenomena, the one first suggested was that the air contained in the interstices of the soil, and in the water with which the soil was saturated, would naturally tend to expand on the removal of a part of the atmospheric weight, and would thus exert a corresponding pressure upon the water held in the soil by capillary attraction. This would in effect decrease the force of capillarity, and a portion of the water would be set free.

As a test for the above hypothesis a third trial was made. A bottle of about 400 c. c. capacity was taken, and through its cork, which was of rubber, a slender glass tube was inserted to such a distance as to nearly reach the bottom of the bottle. The cork was then removed,

and the bottle filled with spring water, after which it was replaced, and the air bubbles beneath it were let out by inserting a pin between the cork and the neck of the bottle, so that the vessel was completely filled with the water. The bottle was then placed under the receiver, and the air pressure reduced to seven pounds per square inch. The water immediately rose in the tube to the height of rather more than five-eighths of an inch, indicating an expansion of the air contained within the water. On admitting the air again, the liquid receded to its former height.

These results seem to prove that changes in atmospheric pressure affect percolation. During the past season an investigation has been made of the flow of water from farm drains, with especial reference to this question. A general, though not an exact coincidence, was readily observed between the fluctuations of the barometer and of the drainage.*

EXPERIMENTS ON CAPILLARY ACTION IN SOILS.

1. The height to which water rises by capillarity in different soils, and its rate of progress.

2. The influence of matters in solution upon the height to which water rises by capillarity.

3. The rate of capillary flow through different soils.

4. The influence of matters in solution upon the rate of capillary flow.

THE HEIGHT TO WHICH WATER RISES BY CAPILLARITY IN DIFFERENT SOILS, AND ITS RATE OF PROGRESS.

Four glass tubes, each five feet long and very nearly one and five-eighths inches inside diameter, were supported in a vertical position by means of a stand constructed for the purpose. The lower end of the tubes entered a copper pan, in which distilled water was kept at a very nearly constant depth by means of an inverted supply bottle. The samples of soil were retained in the tubes by covering the lower end of the latter with fine brass wire-cloth, over which was placed a circular piece of filter-paper of a diameter corresponding to that of the tube, the wire cloth being kept in position by bending it upwards about the tube, and winding it tightly with fine copper wire. Thus the filter-paper prevented the passage of the soil through the wire cloth, while it permitted free access of water.

Tube No. 1 was filled with muck, No. 2 with garden soil, No. 3 with sand and No. 4 with clay, all the soils being air-dry and sifted through

* An illustrated article contributed by the writer to Agricultural Science, Vol. I, pp. 173–177, gives a full report of this investigation.

a sieve containing 100 meshes to the inch. The progress of the water upward by capillary attraction, as indicated by the change in color, was noted daily from May 5 to November 17*. The accompanying table shows the height of the water at the end of each week, and also the weekly progress for the different soils:

THE RISE OF WATER BY CAPILLARY ATTRACTION IN DIFFERENT SOILS.

	Tube No. 1, Muck.		No. 2, Garden Soil.		No. 3, Sand.		No. 4, Clay.	
	Height of water.	Progress during week.	Height of water.	Progress during week.	Height of water.	Progress during week.	Height of water.	Progress during week.
	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.
May 5, 6 P. M	1½	.....	2⅜	.....	3¼	.....	2⅛	.....
12, 7 A. M.	10¾	9¼	17¾	15¾	7¾	4½	17½	15⅜
19, 7 A. M.	12¾	2	23¼	5½	9	1¼	21	3½
26, 7 A. M.	14¼	1½	26½	3¼	10	1	23¾	2¾
June 2, 7 A. M.	15	¾	28⅝	2⅛	10½	½	25⅛	1⅜
9, 7 A. M.	15½	½	29⅞	1¼	†11¾	¼	26	⅞
16, 7 A. M.	16	½	32	2⅛	13	¼	27¼	1¼
23, 7 A. M.	16¾	¾	33¾	1¾	14¼	1⅛	28	¾
30, 7 A. M.	17	¼	35⅛	1⅜	15	⅞	29¼	1¼
July 7, 8 A. M.	17¾	¾	36⅝	1½	16¼	1¼	30	¾
14, 7 A. M.	18⅝	⅞	37⅞	1	16⅞	⅝	30⅜	⅜
21, 7 A. M.	18¾	⅛	38¾	1⅛	17⅛	¼	31½	1⅛
28, 7 A. M.	19⅛	⅜	39¾	1	17½	⅜	32¼	¾
Aug. 4, 7 A. M.	19¼	⅛	40¾	1	18	½	33	¾
11, 8 A. M.	19¾	½	41½	¾	18⅜	⅜	33½	½
18, 7 A. M.	20	¼	42¼	¾	18½	⅛	34	½
25, 7 A. M.	‡20⅞	.....	42⅞	⅝	18⅜	⅛	§.....	.....
Sept. 1, 7 A. M.	21⅛	¼	43⅝	¾	18⅞	½	.....	.....
8, 7 A. M.	21⅜	¼	44⅛	½	19⅛	¼	.....	.....
15, 7 A. M.	21⅝	¼	44⅝	½	19¼	⅛	.....	.....
22, 7 A. M.	21⅞	¼	45⅛	⅝	.....	.....	.....	.....
29, 7 A. M.	22	⅛	45½	¼	19⅜	⅛	.....	.....
Oct. 6, 7 A. M.	22¼	¼	46	½	19⅝	⅛	.....	.....
13, 7 A. M.	22⅜	⅛	46⅜	⅜	19⅝	0	.....	.....
20, 7 A. M.	22⅝	¼	46¾	⅜	19⅞	¼	.....	.....
27, 7 A. M.	22¾	⅛	47¼	½	20	.....	.....	.....
Nov. 3, 7 A. M.	22⅞	⅛	47⅝	⅜	20⅛	.....	.....	.....
10, 7 A. M.	23	⅛	47⅞	¼	20⅛	.....	.....	.....
17, 7 A. M.	23¼	¼	44	⅛	20¼	.....	.....	.....

THE INFLUENCE OF MATTERS IN SOLUTION UPON THE HEIGHT TO WHICH WATER RISES BY CAPILLARITY.

It is stated in works on physics that water rises higher than any other liquid in capillary tubes. To what extent do the slight propor-

* This is the latest date to which the experiment could be conveniently reported. The water at this date had not ceased to rise, except in tube No. 4.

† A slight break in the column occurred at this time, caused by settling of the sand below the wet line. This may have interfered with the subsequent progress of the water.

‡ During the week, the point of measurement was changed to another part of the tube where the water had advanced higher.

§ From this time the progress of the water could no longer be accurately determined, as the color shaded so gradually from the moist part to the dry. It appeared to advance scarcely at all after this date.

tions of soluble matters usually present in soil water influence the height to which it is capable of rising by capillarity? As a partial answer to this question, two capillary tubes of which the diameters were 80 and 90 micro-millimetres respectively, and the length fourteen inches, were attached to a standard rule graduated to fortieths of an inch. This rule was then clamped to a support in a vertical position, and the lower end of the tubes introduced into the liquids named in the table below. The figures expressing the height to which the various liquids rose in the tubes represent fortieths of an inch, and are the average for all the trials, and for the two tubes:

The Influence of Matters in Solution Upon the Height to Which Water Rises in Capillary Tubes.

	Temperature F.	Specific gravity at 49° F.	Number of trials.	Capillary height.	Date.
Manure water	68°	1,010	12	187.79	Feb. 22
One-half manure water	68	.....	16	189.62	Feb. 22
One-fourth manure water	68	.....	8	190.94	Feb. 22
Distilled water	68	.....	8	190.87	Feb. 22
One-fifth manure water	68	.....	12	189.44	Mar. 7
One-tenth manure water	68	.....	12	189.87	Mar. 7
Distilled water	68	.....	12	190.60	Mar. 7
Water filtered through muck	68	1,007	36	189.	Feb. 26
Water filtered through garden soil	65	1,007	24	191.04	Feb. 24
Distilled water	65	.....	24	191.67	Feb. 24

It is evident from the figures that the tendency of all the solutions is to lower the height, but the influence is so small as to be practically of little importance. Other tests were made with water filtered through wood ashes, and with solutions of sulphate and muriate of potash, nitrate of soda, phosphate of lime and sulphate of ammonia. In all the tendency was to reduce the height, and in proportion to the strength of the solution.

The Rate of Capillary Flow Through Different Soils.

The rate at which water passes through a soil by capillarity is of more importance to the agriculturist than the ultimate height to which it may rise in the same soil, because a soil capable of supporting a crop must necessarily be within reach of capillary water. A series of experiments was undertaken to discover the comparative rate at which water passes through samples of garden soil, sand, clay and muck.

Glass combustion tubes of about nine-sixteenths inch inside diameter, and five to six feet in length, were bent slightly at one end and attached to a board in such a way that when the board was placed in a horizontal position the bent end of the tubes could enter a dish of water. One such tube was filled with each of the soils above named,

all of the samples having been sifted through a sieve containing 100 meshes to the inch, and after the filling, the soils were carefully jarred down by holding the board in a vertical position, lifting it slightly and letting it drop upon the floor, continuing this process until the soils ceased to settle. After this, the tubes were again filled by the addition of more soil. The board was then placed in a level position, and the bent end of the tubes connected with a pan of water, the latter being kept filled to the brim. By this arrangement, the influence of gravity upon the action of capillarity is practically eliminated, as the water is required to rise scarcely more than the diameter of the tube, after which it passes the remaining distance in a horizontal direction, and is resisted only by the friction of the particles.

THE RATE OF CAPILLARY FLOW IN DIFFERENT SOILS.

	Dec. 13.	Dec. 20.	Dec. 27.	Jan. 3.	Jan. 10.	Jan. 17.	Jan. 24.	Jan. 31.
Clay	16⅞ in.	23¾ in.	28⅛ in.	31¾ in.	34½ in.	36¾ in.	38⅞ in.	40¾ in.
Garden soil	12⅛	19⅞	26⅛	31⅛	35⅞	40½	44⅝	47¾
Muck	41½	50¼	59⅝*	.....	.....	.....	.....	.....
Sand†	.....	.....	.....	.....	.....	.....	.....	.....

It has been ascertained that the rate of capillary flow is inversely in proportion to the diameter of the tube or pores. From this we may infer that the pores were largest in the sand, next in the muck, and smallest of all in the garden soil. The fact that the rate in the clay was not so well maintained as in the garden soil may be due to the fact that the clay became more consolidated on getting wet.

THE INFLUENCE OF MATTERS IN SOLUTION UPON THE RATE OF CAPILLARY FLOW.

Four glass tubes were filled with garden soil, sifted through a sieve of 100 meshes to the inch, and were placed in a horizontal position as described in the last experiment, two being connected with distilled water, and the remaining two with a saturated solution of nitrate of soda. It was commenced on February 17, and continued until February 28, with the following results:

* Finished. † Finished in two days, 60 in.

INFLUENCE OF NITRATE OF SODA UPON THE RATE OF CAPILLARY FLOW.

	DISTANCE TRAVERSED ON—											
	Feb. 17, 6 P. M.	Feb. 18, 6 P. M.	Feb. 19, 6 P. M.	Feb. 20, 5 P. M.	Feb. 21, 6 P. M.	Feb. 22, 6 P. M.	Feb. 23, 6 P. M.	Feb. 24, 6 P. M.	Feb. 25, 6 P. M.	Feb. 26, 6 P. M.	Feb. 27, 8 A. M.	Feb. 28, 6 P. M.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Tube No. 1, distilled water..	4⅛	10⅜	14	16½	19⅛	21⅜	23⅞	25⅛	26⅝	28¼	29⅛	30¼
Tube No. 2, distilled water..	4⅛	10⅜	13½	16	18¼	20½	22¼	23⅞	25¼	26⅝	27½	28⅝
Tube No. 3, nitrate of soda .	2¾	6¾	9	10½	12¼	13¾	15	16	17	17¾	18¾	19¼
Tube No. 4, nitrate of soda .	3½	7	9¾	10¾	12½	14	15¾	16¼	17¼	18⅛	18⅝	19½
Temperature of room	66	54	47½	50	60	56	56½	48½	58¾	48	45½	49¾

From this, it is very evident that nitrate of soda in a saturated solution decidedly retards the rate of capillary flow.

In the next trial eight tubes were arranged and filled precisely as in the last, with the exception that the garden soil used was washed, by filtering distilled water through it until it was free from matters readily soluble. Two of these were connected with distilled water two with water that had been filtered through muck, two with water filtered through garden soil, and the remaining two with manure water. The experiment was commenced March 10 and continued until April 27. The rate of progress was marked daily, but only weekly periods are reported in the table:

THE INFLUENCE OF MATTERS IN SOLUTION UPON THE RATE OF CAPILLARY FLOW.

	PROGRESS OF THE LIQUID.									
	Specific gravity at 49° F.	March 10, 6 P. M., inches.	March 17, 6 P. M., inches.	March 24, 6 P. M., inches.	March 31, 6 P. M., inches.	April 7, 6 P. M., inches.	April 14, 6 P. M., inches.	April 21, 6 P. M., inches.	April 27, 7 A. M., inches.	
Tube No. 1. Distilled water	.....	$1\frac{7}{8}$	$28\frac{3}{4}$	$42\frac{1}{2}$	$52\frac{3}{8}$	$61\frac{1}{4}$	$69\frac{3}{8}$	...	..	Finished April 15, 7 A. M., $69\frac{1}{2}$ in.
2. Distilled water	.....	$2\frac{1}{8}$	28	$40\frac{3}{4}$	$49\frac{7}{8}$	$58\frac{3}{8}$	$66\frac{1}{8}$	...	..	19, 6 P. M., $70\frac{1}{2}$ in.
Tube No. 3. Muck water	1,007	$3\frac{5}{8}$	$35\frac{1}{2}$	$49\frac{1}{2}$	$58\frac{5}{8}$	$66\frac{3}{4}$	...	...	..	Finished April 14, 7 A. M., $73\frac{7}{8}$ in.
4. Muck water	1,007	$3\frac{1}{2}$	$34\frac{3}{4}$	$49\frac{1}{2}$	$59\frac{1}{4}$	$68\frac{5}{8}$	...	...	..	11, 6 P. M., $73\frac{3}{4}$ in.
Tube No. 5. Garden soil water	1,007	$2\frac{5}{8}$	$33\frac{3}{4}$	48	$58\frac{1}{4}$	$67\frac{3}{4}$	...	...	..	Finished April 14, 7 A. M., $75\frac{1}{2}$ in.
6. Garden soil water	1,007	$2\frac{1}{2}$	35	$49\frac{7}{8}$	$59\frac{1}{2}$	$67\frac{7}{8}$	...	...	..	14, 7 A. M., $75\frac{1}{4}$ in.
Tube No. 7. Manure water	1,010	$1\frac{3}{4}$	$18\frac{3}{8}$	$20\frac{3}{4}$	$21\frac{1}{4}$	...	...	...	..	
8. Manure water	1,010	$1\frac{3}{4}$	20	$24\frac{7}{8}$	$27\frac{1}{8}$	$29\frac{7}{8}$	31	$31\frac{3}{4}$	$32\frac{1}{4}$	

The indications are very clearly that the soluble matters contained in the water from the muck, and the garden soil promoted the capillary flow, but that some quality of the manure water retarded it. The latter was passed through filter paper before being used, but may still have contained viscous material that tended to clog the pores of the soil. In another experiment with vertical tubes, one of which was connected with manure water and the other with distilled water, the manure water again fell behind.

The next trial was intended to discover whether or not the rate of capillary flow may be promoted by the addition of any special substance to the water. The first test was with sodium chloride (common salt). A comparatively pure article of dairy salt was used, and solutions of twenty, ten, five and two and a half per cent respectively were connected with the horizontal tubes, as described in the last experiment.

THE INFLUENCE OF SODIUM CHLORIDE UPON THE RATE OF CAPILLARY FLOW.

TUBE.	PROGRESS OF THE LIQUIDS.						
	June 1, 6 P. M.	June 8, 7 A. M.	June 15, 7 A. M.	June 22, 7 A. M.	June 29, 7 A. M.	July 6, 7 A. M.	
	in.	in.	in.	in.	in.	in.	
No. 1, distilled water.....	2⅜	30	43½	....	....	....	Finished June 19, 47¼ in.
2, distilled water.....	2¾	29⅞	44⅝	56½	65⅞	....	Finished July 4, 72⅝ in.
No. 3, 5 per cent solution.	3⅜	37¾	54⅝	67	....	....	Finished June 27, 73¾ in.
4, 5 per cent solution.	3¼	38⅜	53½	64¾	72⅞	....	Finished July 1, 74¼ in.
No. 5, 10 per cent solution.	2⅜	34½	51⅝	64½	73½	....	Finished June 29.
6, 10 per cent solution.	2⅝	33⅝	50⅝	62⅞	72¼	....	Finished June 30, 72⅞ in.
No. 7, 20 per cent solution.	1¼	28⅝	43¼	54¾	63½	72⅝	Finished July 7, 73¾.
8, 20 per cent solution.	3⅞	29½	43⅞	54⅝	62¾	71⅛	Finished July 9, 74 in.

SECOND TEST — IN PART A DUPLICATE OF THE PRECEDING.

TUBE.	PROGRESS OF THE LIQUIDS.				
	Aug. 25, 7 A. M.	Sept. 1. 7 A. M.	Sept. 8. 7 A. M.	Sept. 15, 7 A. M.	
	in.	in.	in.	in.	
No. 1, distilled water	9⅛	37⅜	50⅝	....	Finished Sept. 10, 52⅛ in.
2, distilled water	8⅜	37¾	52⅞	63¼	Finished Sept. 21, 6 P. M., 71⅞ in.
No. 3, 2½ per cent solution	11⅝	48	64⅛	....	Finished Sept. 14, 73½ in.
4, 2½ per cent solution	10¾	46	62⅜	73⅜	Finished Sept. 15.
No. 5, 5 per cent solution.....	9¾	45¼	62½	....	Finished Sept. 14, 72¼ in.
6, 5 per cent solution.....	9	43½	60¾	72	Finished.
No. 7, 10 per cent solution.....	8¾	41⅜	59⅜	70¼	Finished Sept. 17, 72⅞ in.
8, 10 per cent solution.....	9	41⅝	58	68¼	Finished Sept. 19, 73 in.

It is very evident that the addition of the salt in quantities of ten per cent, or less, promoted the capillary flow, and that with the solutions tested, the maximum rate was reached in the weakest one. The twenty per cent solution, on the other hand, retarded the rate. In another trial made later, solutions at the rate of two and one-half per cent, one and one-quarter per cent, and five-eighths of one per cent respectively, were used. The result indicated little difference in the rate of flow with these solutions.

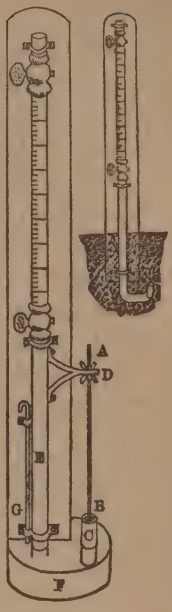
The trials do not show whether the influence of the sodium chloride and the other soluble matters experimented with upon the rate of capillary flow is due to the presence of a particular substance, or whether it is due to a change in the liquid that would be affected as well by dissolving a small amount of any mineral matter in it. Neither do they show that the influence of matters in solution affects the rate of capillary flow in a vertical direction in the same way as in a horizontal direction. Further experiments are needed to develop this interesting subject.

PROGRESS IN MEASURING THE SOIL MOISTURE.

1. Improvements in the soil hygrometer.
2. Experiments to determine whether or not the rate of absorption in the soil is in proportion to its dryness.

In the Report of the Station for 1886, p. 182, is illustrated an instrument designed for measuring the rate of absorption in the soil from a piece of saturated terra-cotta, this rate being assumed to be in proportion to the dryness of the soil. During the past season, considerable attention has been given to perfecting this instrument, which, in its improved form, is shown in the accompanying drawing, the apparatus described last year being shown in a smaller drawing at the right.

In its most primitive form, the instrument may be described as a tube closed at the top, and curved into a return bend at the bottom, with a short cylinder of terra-cotta or other absorbing material inserted part of its length into the short arm, and extending into the bend of the tube. If such a tube is filled with water and its lower end buried in a soil not in a saturated condition, the moisture from the terra-cotta will be absorbed by the soil, and as the water is removed from the curved part of the tube, air bubbles will rise into the long arm, thus supplying more water, while the amount thus removed may be registered at the top. Instead of having the tube closed at the top, one open at the top and provided with two stop cocks, so that it may be refilled with water without removing it from the soil, is used.



In order that such an instrument may be corrected to a standard, the amount of surface exposed by the terra-cotta must be delicately adjustable. This is accomplished by means of the slender brass rod A B, which has threads cut upon its upper end, upon which work the thumb screws shown at D. The rod passes through the cylinder of terra-cotta C, which is attached to it by a small brass washer soldered to the rod at each end of the cylinder. By turning the thumb screws at D, the cylinder is raised or lowered at will, and may be fastened securely at any desired point.

As illustrated in the last report, the tube E made a return bend at the bottom and the cylinder of terra-cotta was inserted directly into the open end. This introduced an error, as the expansion and contraction of the air in the upper end of the tube due to changes in temperature or atmospheric pressure, caused a considerable fluctuation in the height of the water in the short arm, and consequently the cylinder of terra-cotta was unequally supplied with water at different times. In order to avoid this error as far as possible, the shallow closed cup F has been substituted for the bend in the tube. The diameter of the cup is three inches, while that of the tube is but half an inch; hence the slight variations in altitude of the water in the tube due to meteorological changes exert scarcely a perceptible influence upon the depth of water in the cup. A third change consists in the addition of the slender tube G, which forms a connection between the air above the water in the cup, and the external air, thus insuring access of the latter at all times to the cup. This access might become wholly or in part obstructed by the soil, if the only communication between the cup and the external air were by the orifice through which the terra-cotta passes into the cup.

This instrument is designed to be placed in the soil in autumn, in order that the earth may become compact about it in a natural manner; or it may perhaps be inserted at any other time by making the hole just large enough to receive it, and then partially filling this hole with puddled earth in order to secure complete contact of the soil with the terra-cotta.

It is proposed to adjust the instrument to a standard in the air, as it would be difficult or impossible to do this in the soil.

EXPERIMENTS TO DETERMINE WHETHER OR NOT THE RATE OF ABSORPTION IN THE SOIL IS IN PROPORTION TO ITS DRYNESS.

That our hypothesis, that the rate at which soil absorbs water is in proportion to its dryness, is correct, is rendered probable though not proved, by the following tests:

In the first trial, a piece of air dry terra-cotta was immersed repeatedly for a period of fifteen seconds in spring water, at a temperature of 44°, until it ceased to gain weight, and after each immersion placed under a bell glass for two hours or longer to allow the water absorbed to equalize through the mass. It was weighed immediately before and after each immersion, and the gain in weight noted.

A second trial was made with two absolutely dry bricks, in the same manner, except that the bricks were immersed thirty instead of fifteen seconds. These materials were chosen because, while being of a similar nature to soil, they do not slack in water. The amounts of water in grams absorbed at each immersion were as follows:

	AMOUNT OF WATER ABSORBED IN THE—									
	First immersion.	Second immersion.	Third immersion.	Fourth immersion.	Fifth immersion.	Sixth immersion.	Seventh immersion.	Eighth immersion.	Ninth immersion.	Tenth immersion.
Terra cotta	33.25	24.9	20.1	19.5	16.8	10.5	8.6	5.7	3.2	0
Brick No. 1	190. 5	58.1	13.5	32.2	7.8	11.8	0	....	....	.....
Brick No. 2	107. 2	72.5	51.7	27.5	.8	3.6	0	....	....	.....

It appears that the amount absorbed in brick No. 1 did not decrease regularly with each immersion. This brick appeared to absorb moisture from the other one while the two were in contact, under the bell glass. At least No. 2 lost moisture under the bell glass, while No. 1 sometimes gained. This may account for the irregularity.

In the third trial, the instrument used for measuring absorption from the soil, already described, was placed in a cylindrical glass jar, about seven inches inside diameter, and twelve inches in depth, the jar being filled to the top with air-dried garden soil that had been pulverized, and passed through a sieve containing 100 meshes to the inch. The instrument was set in the soil at such a depth that the top of the terra-cotta cylinder was about two inches below the surface. A circular piece of oil-cloth was fitted about the instrument, and tied over the top of the jar, in order to exclude evaporation, and the jar was placed in a close tank-room beneath the barn, where the atmosphere is very moist. The trial commenced July 25, and at date (November 14), is still in progress. The absorption was recorded

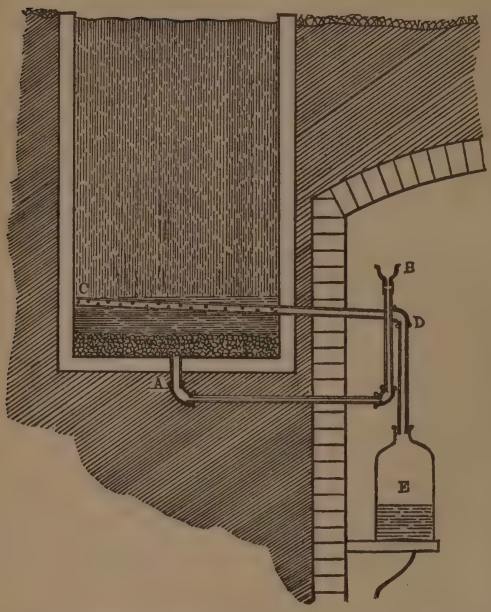
each morning, but only the amounts absorbed during weekly periods are here reported:

1st week	81.8	cubic centimeters.		9th week	32.2	cubic centimeters.	
2d "	58.6	" "		10th "	36.3	" "	
3d "	62.2	" "		11th "	27.9	" "	
4th "	69.6	" "		12th "	24.5	" "	
5th "	55.7	" "		13th "	21.5	" "	
6th "	57.4	" "		14th "	20.5	" "	
7th "	57.9	" "		15th "	11.5	" "	
8th "	39.6	" "		16th "	22.9	" "	

It appears that the absorption decreased as the soil became moist, though the rate of decrease was by no means regular. The instrument might perhaps better have been placed so that the terra-cotta cylinder was at the center of the column of soil, instead of near its top. As it was, gravity probably assisted the absorption by attracting the water downward. After the soil had all become partially wet to the bottom of the jar, which occurred about the eighth week of the trial, the rate of absorption immediately fell off, and thereafter decreased more regularly.

A NEW LYSIMETER.

The lysimeters in use at the station do not differ in kind from those employed at Rothamsted and elsewhere. But a study of their operation has developed the fact that the data secured from them are not applicable to the soil in its natural condition. The soil within being in connection with no permanent water-table, and the acquisition of water by capillarity from beneath being entirely excluded, the conditions within the inclosed prisms of earth are radically different from those existing in the outside soil. The earth within becomes abnormally dry in times of drought, and on the advent of rain absorbs more water than it would if not thus isolated. The upward movement of the soil water in fair weather being restricted, the soluble soil constituents wash downward faster and appear in the drainage water in greater proportion than is the case under normal conditions.



In the true lysimeter the movements of water must be the same as in the natural soil. As a means of approaching this condition, an apparatus for which I am in part indebted to the suggestions of the station chemist, Dr. Babcock, has been constructed after the plan shown in the accompanying drawing. It differs from the lysimeter heretofore used in being provided with an artificial water-table, which is kept at a nearly constant height by the addition of sufficient water daily to make up the loss from evaporation. The tube that passes out through the bottom of the lysimeter at A, instead of serving as the outlet for drainage, curves upward, forming a supply-pipe, water being added at the funnel B. The drainage passes out through the drainpipe C D, which is perforated in the part within the lysimeter, and of which the lower end enters the bottle E.

In order to insure an even distribution of the water, a layer of pebbles is placed at the bottom of the lysimeter, and this is covered with another of clean sand, the latter reaching up far enough to cover the drain-pipe. Thus the soil above, while not directly in contact with water, rests upon a constantly saturated layer of sand.

This lysimeter furnishes not only a measure of percolation, but also during dry weather, an approximately correct daily record of soil evaporation. The excess of drainage over the quantity of water added through the supply-pipe represents the percolation, while the difference between the amount added and the drainage equals the evaporation. The total evaporation for a given period is the difference between the total amount added plus the total rainfall, and the total drainage.

The conditions within this lysimeter differ from those in the outside soil in the height of the water-table being constant. But by providing lysimeters of various depths and by noting the fluctuations in the height of the natural water-table, a fair estimate may be formed of the movements of water in the natural soil.

THE HEIGHT OF WATER IN WELLS.

As having a possible bearing upon some of the phenomena connected with the movements of soil water, a series of measurements has been made during the past year, of the height of the water in an abandoned well near the station buildings. This well, which is forty feet in depth, is situated near the top of a ridge of such a height that in three directions it is necessary to go but a few hundred feet before reaching land that lies lower than the bottom of the well, while in the other direction is a railroad cut, the bottom of which is but slightly above that of the well. It would appear therefore that the water in this well must be sustained almost entirely by the capillary attraction exerted by the soil.

The measurements commenced December 3, 1886, and have been continued daily until the present time (November 15, 1887). In the table below is given the distance from the curb to the surface of the water on the 3d of December, and on the first day of each month thereafter, and also the rainfall of the preceding month in inches:

DATE.	Distance to water.		Rainfall of preceeding month.
	feet.	inches.	
December 1	13	2	3.48
January 1	6	4	1.24
February 1	5	8	.18
March 1	4	$10\frac{1}{4}$	2.97
April 1	5	$0\frac{3}{4}$	.48
May 1	4	$2\frac{1}{4}$	1.37
June 1	6	10	.46
July 1	9	2	2.01
August 1	10	$5\frac{3}{4}$	6.37
September 1	11	3	3.03
October 1	13	$4\frac{1}{2}$	.75
November 1	15	$4\frac{1}{2}$	1.74

The figures have some interest as showing to what extent the soil water was depleted through evaporation during the summer and autumn months, notwithstanding the rainfall. The water in the well rose rapidly during December, and continued to rise more or less until May 3d, at which time it was 9 feet 1 inch higher than on December 3d, having risen on the average about three-fourths of an inch per day. From this time it commenced to fall, and has continued to recede almost without intermission until the present time (November 15), when the surface is 16 feet 1 inch below the curb

or 12 feet lower than on May 3. The rainfall from November 15 to May 1, was 8.83 inches, or about 1.6 inches per month. From May 1 to November 15, it was 20.81 inches, or about 3.2 inches per month. In other words, a rainfall of 1.6 inches per month during the colder part of the year increased the amount of soil water sufficient to raise the well water three-fourths of an inch per day during the whole period, while despite a rainfall of double that amount during the remainder of the year, the soil water was so much depleted by evaporation that the well water lowered at an equal rate per day. The indications are that the soil becomes stocked, so to speak, with water during the colder part of the year, and that it pays out during the summer and autumn at a far more rapid rate than it is replenished by the rains of these seasons.

VEGETABLES.

A description of varieties, with classification, lists of synonyms and bibliography of

1. The Garden Beet.
2. The Carrot.
3. The Radish.
4. The Turnip.
5. The Onion.
6. The Celeriac.
7. Celery.
8. Spinach.
9. The Cucumber.
10. The Squash and Pumpkin.
11. The Egg Plant.
12. The Tomato.

INTRODUCTORY.

In this report is presented descriptions, with a classification, lists of synonyms and bibliography of the more important vegetables not heretofore reported upon,* with the exception of the melons and cauliflower, of which the plants have generally failed to make normal development in the Station garden; and of the pepper, of which our notes are still incomplete.

The data from which the descriptions are made have been accumu-

* Similar data were presented with reference to the garden bean, in the reports of the Station for 1882 and 1883; to the Sweet Corn in 1884; to the Pea in 1884; the Lettuce in 1885, and the Heading Cabbage in 1886.

lating since 1882, and nearly all of the varieties described have been grown more than one season.

NAMES AND AUTHORITIES.

As in former reports, liberty has not* been taken to change names, however inconvenient they appeared, but in every case where there was a choice, the name that seemed most appropriate has been adopted.

Although the list of varieties described in the vegetables treated is rather exhaustive, it is not supposed to be complete. Some, of which our notes do not furnish full data, have been omitted, and a few named in the seed catalogues have not been grown at the Station.

The list of synonyms, though often rather extensive, has been confined to those actually tested in the garden, and to those taken from horticultural works. Had the slightly differing names that seed catalogues apply to standard varieties been added, the number of synonyms might in many cases have been greatly increased.

How far these descriptions will prove reliable under other conditions of soil and climate, is a question that experiment must decide. They are offered only as a contribution to vegetable botany.

The authority is appended for both the names and synonyms. An authority printed in small capitals indicates that the variety to which it is appended has already been more or less thoroughly described, under that name, by the author, or in the work cited.† This furnishes a rather complete bibliography of the varieties.

An authority added to the adopted name of a variety, and printed in small letters, without a date, indicates that this name has been given as a synonym by the author or in the work cited.

The date or dates appended indicate that the authority is a seedsman, from whom the seed was procured under the name, and in the year or years specified.

Synonyms that have been determined or verified at the station are printed in italics. In cases of doubt the name is followed with the interrogation point. Synonyms not printed in italics have not been verified, and are given only on the authority appended to them.

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* A single exception occurs in the case of the Yellow Pattypan squash, to which the word "pattypan" was annexed in order to ally it with its near relative, the White Pattypan.

† Initials are sometimes used as abbreviations for the names of seed firms, as H. & W., J. & S., etc. Though of necessity printed in capitals, these do not in any case refer to authors.

EXPLANATION OF ABBREVIATIONS, WORDS, AND PHRASES USED IN THE DESCRIPTIONS.

For a list of the abbreviations of the names of seedsmen see the close of the report of the Horticulturist in this volume.

Abbreviations for the names of authors and works upon gardening are used as follows:

A. de Cl.— *Album de Clichés,* Vilmorin, Andrieux et Cie., 1883.

BRILL.— Farm Gardening and Seed Growing, Francis Brill, 1872.

BURR, or Burr.— Field and Garden Vegetables of America, Fearing Burr, Jr., 1853.

GREG.— Cabbages and how to grow them, J. J. H. Gregory, 1870.

HEN.— Gardening for Profit, Peter Henderson, 1887; Les pl. pot.— Les plantes potagères, Vilmorin, Andrieux et Cie., 1883.

MORTON.— Cyclopedia of Agriculture, 1855.

VEG. GAR.— The Vegetable Garden, the English edition of *Les plantes potagères,* edited by William Robinson, 1885.

VIL.— *Les plantes potagères,* Vilmorin, Andrieux et Cie., 1883.

WHITE.— Gardening for the South, William N. White, 1868.

Additional abbreviations are employed as follows:

(d.) "from description"— applied to synonyms that have been identified from a printed description.

Dan.— Danish.

Flan.— Flanders.

Fr.— French.

Ger.— German.

Holl.— Holland.

Ital.— Italian.

Port.— Portuguese.

Syn.— Synonym.

When two or more foreign synonyms are given, the initial is generally substituted for the word expressing the kind of vegetable in the second and following names of each language. The same is true in certain cases in the English synonyms.

The effort has been made to use terms in the descriptions that should be as far as possible self-explanatory. A few of the words or phrases used, however, have been assigned a special meaning, and some others are introduced which have not often been used in horticultural descriptions. These are here explained:

Border.— Of the leaf, the part of the limb adjacent to the margin.

Club-shaped.— Shaped like a club, swollen at one end and constricted into a neck toward the other.

COMMON

Cylindri-conical.— Said of root vegetables that are cylindrical for a part of their length and then taper to a point.

Dishing.— Said of leaves in the Cucurbitæ when the limb is depressed at the center, forming a funnel-like basin.

Foliage.— Refers chiefly to the aspect or amount of the leafage as a whole. The leaves, petioles, midribs and veins are considered as parts of the foliage.

Margin.— Of the leaf, the line bounding the contour.

Obovate.— Egg-shaped, with the narrower end toward the stem.

Præmorse.— Said of root vegetables that end abruptly at the lower end as if bitten off.

Root-circle.— In the bulb of the onion, the circular space at the bottom, occupied by the roots.

Striate.— Said of root vegetables to express the slight transverse ridges and depressions that extend partly or entirely about the root, as in many of the carrots.

In the article on the tomato, other words and phrases used with reference to this vegetable only are explained.

ARRANGEMENT OF THE VARIETIES.

The order of arrangement follows the classification, and is not strictly alphabetical. A given variety of which the name is known may most readily be found, therefore, by consulting the index of names and synonyms, which is appended for each vegetable separately, immediately after the last variety.

If, however, it is desired to name an unrecognized variety, it may be most readily done by consulting the synopsis which precedes the varieties of each vegetable.

As the varieties are classified, characters that are the same throughout a group, are usually omitted in the variety descriptions.

METHOD OF CLASSIFICATION AND SELECTION OF SAMPLES.

In the esculent root vegetables, the varieties are classified first, with reference to the form, and second with reference to the color of the roots.

In the other vegetables treated, the method of classification for each is stated at the commencement of the article.

With the exception of the radish, the samples used for description in all the vegetables were supposed to be fully developed. In the latter they were taken when of fair edible size.

THE GARDEN BEET.

Synopsis of Classification.

1. Root oblate or top-shaped:
   - A. Root red. Nos. 1–6 incl.
   - B. Root yellow. No. 7.
2. Root oval:
   - A. Root red. Nos. 8-9.
   - B. Root yellow. No. 10.
3. Root half long:
   - A. Root red. Nos. 11–13 incl.
   - B. Root yellow. No. 14.
4. Root long conical:
   - A. Root red. Nos. 15–20 incl.
   - B. Root yellow. No. 21.
   - C. Root black or blackish. Nos. 22-23.

DESCRIPTION OF THE VARIETIES.

1. Root oblate or top-shaped.

A. Root red.

No. 1. BASSANO, BRILL; BURR.

Syn. Early Flat Bassano, Burr; VEG. GAR.: Turnip-rooted Bassano, Burr: *Early Bassano*, Sib., '83: *Early Flat Bassano*, Hen., '87: Thor., '85, '87: Fr., Betterave rouge de Bassano, (d) Vil.: Ger., Plattrunde Bassano Salat-Rübe, Vil.: Plattrunde Bassano Runkle rübe, A. de Cl.

Root resembles in form the Egyptian beet, but is somewhat larger in size, grows deeper in the soil, has a larger tap-root, more rootlets, and more abundant foliage; well developed samples 5 or 6 in. in diameter, 3 to 3½ in. through the axis; like the Egyptian, the roots become irregular when full grown; surface generally smooth; skin grayish or russet above ground, clear rose red below; neck sometimes small and surrounded with a circle of scales, at others undefined, the entire crown being covered with small tufts of leaves;—foliage abundant, rather lively green, half erect; petioles rather short, washed with red;—flesh zoned with white and rose, sweet, tender and well flavored while young, becoming rather coarse and fibrous when full grown;—season medium.

A very productive variety of Italian origin; formerly the most popular early beet, but now largely superseded by the Egyptian and Eclipse.

Correctly figured in Les pl. pot., p. 40; Veg. Gar., p. 82.

LANDRETH'S VERY EARLY, Land., '84; Syn. *Landreth's Very Early Forcing*, Land., '85, appeared to be a variable strain of the Bassano, somewhat earlier, and with more scanty foliage.

PHILADELPHIA EARLY TURNIP, Land., '85, appeared to be a strain of the same, growing possibly a little larger, more highly colored and maturing a few days later.

No. 2. EARLY BLOOD TURNIP, Greg., '86; HEN.; Sib., '83; Thor., '87.

Syn. *Early Blood Red*, Land., '86: Early Blood Turnip Rooted, BURR: Early Turnip, Burr: Early Turnip Rooted, BRILL; WHITE.

Root short top-shaped, growing quite largely above ground; well developed samples 6 in. in diameter, 5 in. through the axis; skin dull purplish red; tap-root rather large; side-roots few; neck small;—foliage medium, rather strongly colored, particularly late in the season; petioles and veins deep carmine;—flesh blood red zoned with lighter, very crisp, tender and sweet;—season a few days later than that of the Bassano.

Formerly the most popular early beet, but now largely superseded by the Egyptian and Eclipse.

Numerous strains of this variety are extant. The following have been grown at the Station:

BASTIAN'S BLOOD TURNIP, HEN., '87; Thor., '87;—Syn. *Bastian's Early Blood Turnip*, Greg., '83, '86, '87; *Bastian's Extra Early*, Hen., '86; *Extra Early Blood Turnip*, Thor., '83.

Differs from the above, if at all, in being slightly earlier.

DEWING'S EARLY BLOOD TURNIP, Greg., '86, '87;—Syn. *Dewing's Extra Early Turnip*, Thor., '87: *Dewing's Improved Blood Turnip*, Sib., '83; HEN., '87.

Root rather deeper red than in the Early Blood Turnip, and rather more symmetrical.

EARLY BLOOD TURNIP IMPROVED, Fer., '83;—Syn. *Burpee's Early Turnip*, Burpee, '86.

Tops rather more scanty than in the Early Blood Turnip.

HATCH'S BLOOD, Thor., '85;—Syn. *Hatch's Blood Turnip*, Greg., '83, appeared scarcely distinct from Early Blood Turnip.

The French variety BETTERAVE ROUGE ROND PRECOSE;—Syn. *Turnip-rooted Red*: Ger., *Runde dunkelrothe frühe Salat-Rübe* of Les plantes potagères very closely resembles, if it is not identical with, the Early Blood Turnip.

No. 3. ECLIPSE, Greg., '87; HEN.; Thor., '83, '87.

Syn. *Eclipse Turnip*,* Greg., '85: *New Eclipse*, Burpee, 86.

Root roundish, somewhat oblate, very regular, becoming quite oblate and somewhat irregular when full grown, growing almost entirely above ground; tap-root clearly defined; well developed samples 3½ in. in diameter, 2½ in. through the axis; surface very smooth, without side-roots; skin blackish red below ground, russet and slightly scaly above; neck very small;—foliage slightly more abundant than that of the Egyptian, deep purple, sometimes inclining to green; petioles and veins carmine.

Of superior quality; — in season slightly later than Egyptian.

"Market gardeners in the vicinity of New York claim that it is bound to be the leading market sort." Hen.

No. 4. EGYPTIAN, Greg., '87.

Syn. *Dark Red Egyptian*, Sib., '83: Early Dark Blood Egyptian, BRILL, (d): Egyptian Dark Red Turnip Rooted, VEG. GAR.; Vil.: Egyptian Red Turnip, Vil.: *Extra Early Egyptian*, Thor., '87: *New Dark Egyptian Turnip*, Thor., '85: *New Round Egyptian or Athens*, Dam., '86: Fr., Betterave rouge noir plate d' Egypt. VIL.: Ger., Egyptische oder Athener plattrunde schwarzrothe Salat-Rübe, Vil.: Schwarzrothe aus Ægypten Runkel-rübe. A. de Cl.

Root oblate, much flattened, sometimes slightly concave below, regular while young, becoming distorted when full grown; growing almost entirely above ground; well developed samples 3 to 5 in. in diameter; surface very smooth; skin dull, dark, purplish red; tap-root remarkably slender and well defined; neck small; — foliage scanty or medium, reddish brown, more or less mixed with green; leaves more or less waved, borders finely undulate, petioles long and slender, rich red;— flesh dark purplish red, fine-grained, crisp, tender and sweet.

This is generally considered to be the earliest variety of garden beet, and is perhaps at present the most popular one for market. It is very productive for an early beet, as owing to its small foliage, the rows will bear planting closer than most other varieties, and on rich soil, the roots will develop even when considerably crowded.

Introduced into this country about 1869; — of Italian origin.

Correctly figured in Les pl. pot., p. 40; Veg. Gar., p. 81.

CROSBY'S EARLY EGYPTIAN, Greg., '85. A strain of the Egyptian of superior quality, producing a less flattened root, without being less early.

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* The ECLIPSE TURNIP of the Vegetable Garden does not answer to this description.

No. 5. RED FLAT TREVISE, Vil., '84.

Syn. *New Early Red Flat Turin*, Thor., '87: *New Round Treviso*, Dam., 86: Trevise Early Salad, or Turin Red Spring, VEG. GAR.: Fr., B. rouge á salade très hâtive de Trévise, or B. rouge printanière de Turin, Vil.

Root short top-shaped, sloping abruptly to the small or medium neck; very irregular when full grown, growing largely beneath the soil; well developed samples 2½ in. in diameter in both directions; surface more or less striate, side roots few; skin deep dull dark red in the lower half, light brown, or russet above; — foliage rather scanty, rich glossy purple; leaves slightly waved, borders finely undulate; — flesh ringed with blackish red and scarlet.

Nearly as early as the Egyptian, and said to be of better quality for use while young. In our trials it bursted badly when left in the ground until full grown and proved far less productive than the Egyptian.

No. 6. ROUND EARLY RED NAPLES, Dam., '86.

Resembles the Eclipse though less regular in form, with less highly colored flesh; well developed roots 5 in. in diameter, 4 in. through the axis; neck small; tap-root well defined, slender; — foliage medium, pale green; petioles and veins striped and tinged with carmine.

B. Root yellow.

No. 7. YELLOW TURNIP, Vil.

Syn. *Early Yellow Turnip*, Hen., '87; Thor., '83, '87: Orange, Vil.: *Round Yellow Turnip*, Greg., '86, '87: Yellow or Orange Turnip, VEG. GAR.: Yellow Turnip-Rooted BURR: Fr., Betterave jaune ronde sucrée, VIL.: Ger., Gelbe runde süsse Salat-Rübe, Vil.

Root roundish, inclining to top-shaped; growing mostly above ground, with a thick tap-root; well developed samples 4½ in. in diameter, 5 in. through the axis; surface usually very smooth; skin orange or rich yellow below ground, brown above, rough and scaly about the rather large neck; — foliage abundant; leaves rather short and broad, yellowish green, wrinkled and undulate; petioles and veins yellow; — flesh zoned with pale yellow and white, taking when cooked, an orange tint; — season medium.

Little grown for the table, as its color is unpopular.

Correctly figured in Les pl. pot., p., 41; Veg. Gar., p. 83.

2. Root oval.

A. Root red.

No. 8. DELL'S BLACK-LEAVED, Vil.

Syn. Dell's Crimson, Vil.: Dell's Dark Crimson Dwarf, VEG. GAR.: *Dell's Flower Garden*, Sib., '84: Osborn's Selected Garden, Vil.: Fr., Bet-

terave rouge de Dell, VIL.: Betterave rouge naine de Dell à feuille noir, Veg. Gar.: Ger., Dell's schwarzrothe Runkelrübe, A. de Cl.

Resembles the Pear-Shaped in many respects, but the root inclines more to conical, and the foliage is more abundant; the leaves more blistered and less thick.

Sometimes grown as an ornamental beet.

Correctly figured in Les pl. pot., p. 37; Veg. Gar., p. 79.

The SAINT OSYTH, Sib., '84, may be called a strain of the above, and is apparently about intermediate between this and the Pear-Shaped.

No. 9. PEAR-SHAPED, Vil.

Syn. *Dark Red Pyriform or Strasbourg*, Vil., '84: *Erfurt Black Red*, Ben., '83: Half Long Dark, Vil.: Intermediate, Veg. Gar.: *Ne Plus Ultra*, Thor., '85: Strasbourg Pear-Shaped, VEG. GAR.: Fr., *Betterave Piriforme de Strasbourg*, VIL., '84: B. rouge de Strasbourg, Vil.: Ger., Schwarzrothe birnförmige Salat-Rübe, Vil.

Root short fusiform or oval, growing usually below ground; well developed samples 3½ in. in diameter, 7 in. through the axis; surface more or less indented with shallow depressions, sometimes slightly striate, or marked with narrow light brown stripes, very rough and scaly about the rather large neck; skin very dark purplish red, light brown about the neck; side-roots numerous but very short;—foliage abundant, very dark purple, inclining to black; leaves somewhat waved, with slight appearance of blistering, border undulate; petioles same color as the limb;—flesh deep dull red, with rings of reddish pink, the depths of the shades varying in different samples.

The root of this variety is more deeply colored than that of any other, but it is only moderately productive. In season it is intermediate.

Correctly figured in Les pl. pot., p. 39; Veg. Gar., p. 80.

B. Root yellow.

No. 10. GOLDEN TANKARD, Land., '84, '85.

A very symmetrical variety; roots regularly oval, growing about one-third above ground; well developed samples 4 in. in diameter, 5 or 6 in. through the axis; surface usually remarkably smooth, a little striate below, and hollowed where the side-roots are attached; the latter are rather numerous in the lower half, but usually small; skin dull orange below ground, shading to yellowish brown about the small neck;—foliage rather scanty; leaves clear green, borders usually rather finely undulate; petioles, midribs and larger veins greenish white;—flesh zoned with white and lemon color;—season medium.

3. Root half long.

A. Root red.

No. 11. HALF LONG BLOOD, BURR; Land., '86; Thor., '85.

Syn. Dwarf Blood Burr: *Dwarf Deep Blood Red*, Vil., '84: Dwarf Red, VEG. GAR.: Fine Dwarf Red, Burr: Early Half Long Blood, Burr: Nutting's Selected Dwarf Red, WHITE; Vil.: Fr., *Betterave rouge naine*, VIL., '84. Ger., Schwarzrothe zwerg Salat-Rübe, Vil.

Root regular conical, sloping to the slender neck, growing mostly beneath the soil; well developed samples 3 in. in diameter, 6 to 10 in. long; surface very smooth, slightly striate in places; side-roots very small and few; skin dark dull red, light brown or russet about the neck; — foliage abundant, very spreading; leaves dark glossy purple, with a slight metallic luster in some plants, much longer than broad, somewhat blistered, border slightly undulate; — flesh ringed with blackish red and scarlet; — season intermediate.

A sweet, well flavored, good-keeping variety, by many considered superior in quality to the Long Blood.

Correctly figured in Les pl. pot., p. 37; Veg. Gar., p. 79.

BASTIAN'S HALF LONG BLOOD, Greg., '83, '86, '87; a strain of the above having very dark colored flesh.

HENDERSON'S PINEAPPLE, Greg., '83, '87, Syn. Half Long or Pineapple, BRILL; very closely resembled the Half Long Blood. The root rounded rather more gradually to the neck, the side-roots were rather more numerous, and the color of the flesh was perhaps slightly deeper.

OMEGA, Till., '85, appeared to be a strain of the Half Long Blood, differing from it in being a little more slender, having the surface more striate, with more side-roots and with more scanty foliage.

PERFECTION, Everitt, '85. A strain of the Half Long Blood with a rather more symmetrical root.

No. 12. VEITCH'S CHELSEA, Ben., '86.

Root short conical, rounding or tapering to a slender neck, and growing 2 to 3 in. above ground; well developed samples 11 in. long, 4 in. in diameter; surface somewhat irregular, striate in the lower half; skin deep, dull red; — foliage very abundant, leaves rich glossy purple, shading to green in some plants; — flesh very deep red, ringed with paler red.

Possibly only a strain of Whyte's Black.

No. 13. VICTORIA, Thor., '84, '85; VIL.

Root very short conical, sloping to a rather small neck, growing slightly above ground; well developed samples 4 in. in diameter, 6 in. through the axis; surface usually smooth, often somewhat furrowed in

the larger specimens; skin very deep red, approaching black;—foliage very abundant; leaves very large, somewhat resembling those of the ornamental chards, deep glossy purple, with more or less metallic luster; petioles carmine;—flesh ringed with dark and pale red, with some white spots in occasional samples.

"Less remarkable for its merit as a vegetable than for the peculiar metallic appearance of its foliage; it is used as much as an ornamental plant as a vegetable." Les pl. pot., p. 41.

B. Root yellow.

No. 14. YELLOW CASTLENAUDARY, BURR; VEG. GAR.; Vil., '84.

Syn. Small Yellow, Vil.: Fr., *Betterave jaune de Castlenaudary*, Vil., '84.

Root short conical, sloping to the rather small neck, growing below ground; well developed samples 6 in. long, 2½ in. in diameter; surface slightly striate; skin orange in the lower half, shading to brown above; tap-root often branched;—foliage abundant, spreading; leaves large, green, somewhat blistered with undulate borders; petioles short, rich yellow;—flesh ringed with cream-colored and translucent zones.

"An excellent table beet, being tender, yet firm, and very sweet when boiled." Burr.

4. Root long conical.

A. Root red.

No. 15. CROWN PRINCE, Thor., '85.

Root rather long regular conical, sloping to the small neck, growing 1 or 2 in. above ground; well developed samples 11 in. long, 3 in. in diameter; surface somewhat striate; side-roots mostly very small, on opposite sides, but not in furrows; skin dull, dark red, inclining to gray about the neck;—foliage abundant, rather erect; leaves shading from deep glossy purple to clear green, borders slightly undulate; petioles and veins reddish purple;—flesh ringed with dull dark, and pale pinkish red.

No. 16. DRACŒNA LEAVED, Vil., '87.

Syn. Fr., *Betterave rouge à feuille ornementale*, Vil., '87.

Root long conical, regular, growing 2 to 3 inches above ground; well developed samples 2½ in. in diameter, 10 in. long; deep dull red; surface smooth, not furrowed, striate in the lower half; side-roots rather numerous; neck small;—foliage very distinct; leaves very narrow, on long petioles, curving downward gracefully and becoming entirely of a rich, deep purple color late in the season;—flesh very deep, blood red, circled with a somewhat paler shade.

No. 17. LONG BLOOD, BURR; WHITE.

Syn. Common Long Blood, Burr: *Long Blood Red?*, *Land.*, '84; *Long Dark Blood*, Ferry, '83; *Long Red?*, Thor., '85.*

Root long conical, rounding to the rather large neck, growing mostly beneath the soil; well developed samples 12 in. long, 2½ in. in diameter; surface more or less striate, with a row of rootlets extending nearly the whole length on either side; skin deep dull red;—foliage medium, or rather scanty; leaves rich glossy purple; little waved, margins finely undulate; petioles pale red;—flesh deep red, more or less prominently marked with stripes of paler red;—season late.

Formerly one of the most popular beets for winter use, now largely superseded by the Long Smooth Blood.

No. 18. LONG SMOOTH BLOOD, BRILL; HEN.; Thor., '85.

Syn. Early Long Blood (d), WHITE: Improved Long Blood, BURR: Large Blood Red (d), VEG. GAR.; Vil.: *Long Smooth Blood Red*, Ev., '85; Hen., '87; Thor., '85: *Long Smooth Dark Blood*, Greg., '86: Fr. Betterave rouge écarlate, Vil.: B. rouge grosse (d), Vil.: B. rouge longue, Vil.: Ger., Lange blutrothe Salat-Rübe, Vil.

Developed from the Long Blood, than which it is of much larger size, of better quality, and a week earlier. Root cylindrical or long conical, rounding gradually to the rather large neck, growing ⅓ to ½ above ground, often bent and distorted and sometimes forked below; well developed samples 12 to 18 in. long, 2 to 4 in. in diameter; surface considerably furrowed and somewhat striate; skin dull dark red;—foliage very abundant, leaves varying from dark rich glossy purple to green, with carmine petioles, ribs and veins;—flesh zoned with very deep, almost blackish red, and bright crimson.

At present considered the standard market beet for winter use.

Correctly figured in Les pl. pot., p. 38; Veg. Gar., p. 80.

No. 19. PINEAPPLE, Hen., '86, '87.

Syn. *Henderson's Dwarf Pineapple*, Sib., '83: Pineapple Short Top, BURR.

Root long conical, rather slender, growing slightly above ground; well developed samples 2½ in. in diameter, 9 in. long; skin very deep dull red; neck small;—foliage remarkably scanty; leaves strongly inclining to purple, becoming intense purple late in the season, long

* This appears to be the *Betterave rouge longue lisse* of Vilmorin, Synonyms, Long Smooth Blood Red; Long Smooth Rochester; Ger., Lange dunkelrothe amerikanische Salat-Rübe and the American Long Smooth Blood-Red, or Radish beet of the Vegetable Garden.

narrow, with undulate borders, on rather short, carmine petioles; — flesh intense, deep blood red, sweet, tender, and of superior quality for table use.

SHORT'S PINEAPPLE, VIL.— Syn. Henderson's Pineapple, Pineapple Dwarf Red appears to closely resemble the above with the exception that it has orange, instead of carmine petioles.

No. 20. COVENT GARDEN, Vil.

Syn. Covent Garden Red, VEG. GAR.: *Red Covent Garden*, Vil. '84: Fr., *Betterave de Covent-Garden*, VIL., '84.

Root very slender conical, tapering to a long slender tap-root, and rounding to a very small neck, growing below ground; well developed samples 1½ in. in diameter, 7 in. through the axis; surface somewhat striate, rather rough from the presence of abortive side-roots when full grown; skin dull deep red; — foliage extremely scanty; leaves deep purple, slightly glossy, little waved, borders finely undulate; petioles deep purple, with a paler stripe above; — flesh ringed with deep red and scarlet.

This seems admirably adapted for use while young, but quite unsuited to winter use unless sown very late. Its very scanty foliage, and slender root would seem to make it valuable for forcing,

B. Root yellow.

No. 21. LONG YELLOW, VEG. GAR.; Vil., '84.

Syn. Large Yellow, Vil.: Orange, Vil.: Fr., *Betterave jaune grosse*, VIL., '84: B. jaune longue, Vil.: Ger., Grosse lange gelbe Salat-Rübe, Vil.: Lange gelbe Salat-Rübe, A. de Cl.

Root long conical, or cylindri-conical, growing ⅓ to ½ above ground; well developed samples 12 in. long, 2½ in diameter; surface somewhat striate, often furrowed longitudinally along the line of the very short side-roots; skin orange in the lower half, shading to light brown above; neck large; — foliage abundant, inclining to erect; leaves green, slightly waved, with somewhat undulate borders; petioles midribs and veins pale yellowish green; — flesh zoned with white and translucent rings.

The beet "principally cultivated by the cow keepers of Paris and vicinity, on account of its reputed high nutritious and milk-producing qualities. * * * The most productive, and one of the best yellow-fleshed kinds." Les pl. pot., p. 41.

Correctly figured in Les pl. pot., p. 41; Veg. Gar., p. 82,

C. Root black, or blackish.

No. 22. BLACK-SKINNED, BURR (credited to Vil.),

Syn. *Crapaudine*, Ben., '83; VIL.: Oak Bark-Skinned, Burr: Rough Skinned, VEG. GAR.; Vil.: Fr., Betterave écorce, Vil.: B. écorce de chêne, Vil.: B. noire écorce de sapin, Vil.: B. précose noire, Vil.: Ger., Dunkelrothe rauhhäutige Crapaudine Salat-Rübe, Vil.

Root conical, often irregular, growing beneath the soil; well developed samples 3 in. in diameter, 10 in. long; skin resembling that of a black winter radish, being much cracked, reminding one of the bark of young ash or hickory trees, whence its name; side-roots rather numerous; neck medium or large;—foliage medium, rather spreading; leaves mostly green, borders somewhat undulate; petioles red;—flesh deep red, zoned with paler red, or white.

Rather early, of fine flavor, good for summer use.

Correctly figured in Les pl. pot., p. 36; Veg. Gar., p. 78.

No. 23. WHYTE'S BLACK, Vil.; VEG. GAR.

Syn. Barrett's Crimson, Vil.: Oldacre's Blood Red, Vil.: Osborne's Improved Blood Red, Vil.: Perkin's Black, Vil.: Whyte's Dark Crimson, BURR: Fr., *Betterave rouge foncé de Whyte*, VIL., '84: Ger., Whytes schwarzrothe Runkle-Rübe, A. de Cl.

Root conical, tapering abruptly, or rounding to the medium neck, often somewhat furrowed longitudinally, growing below ground, or in some cases 1 or 2 in. above; well developed samples 9 in. long, 3 in. in diameter; surface somewhat striate; skin of a peculiar dark grayish or leaden color by which the variety may be distinguished, light brown or russet in the part above ground;—foliage rather abundant; leaves deep purple in some plants, varying through intermediate shades to green in others, borders somewhat undulate; petioles deep purple or carmine; flesh ringed with very deep dull red and scarlet, the shades varying somewhat in different roots.

One of the best varieties for winter and spring use, as it keeps remarkably well, and is of excellent quality.

Correctly figured in Les pl. pot., p. 38; Veg. Gar., p. 79.

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THE CARROT.

SYNOPSIS OF THE CLASSIFICATION.

1. Root distinctly pointed.
   - A. Root long — the length exceeding four times the diameter.
     - * Root white. Nos. 1-4 incl.
     - † Root yellow. Nos. 5, 6.
     - ‡ Root orange or red. Nos. 7-11 incl.
     - ‖ Root purple. No. 12.
   - B. Root half-long — the length not exceeding four times the diameter.
     - * Root white. No. 13.
     - ‡ Root orange or red. Nos. 14-18 incl.
2. Root distinctly præmorse, (blunt at the lower end.)
   - A. Root long — the length exceeding four times the diameter.
     - ‡ Root orange or red. No. 19.
   - B. Root half-long — the length exceeding two, but not exceeding four times the diameter.
     - ‡ Root orange or red. Nos. 20-24 incl.
   - C. Root very short — the length not exceeding twice the diameter.
     - ‡ Root orange or red. Nos. 25-28 incl.

DESCRIPTION OF THE VARIETIES.

I. Root distinctly pointed.

A. Root long — the length exceeding four times the diameter.

* Root white.

No. 1. LONG WHITE, Greg., '86; Thor., '85.

Syn. Common White, Burr.

Root long conical, usually irregular; growing 2 to 4 in. above ground, well developed samples 2 in. in diameter, 10 in. long; skin white below ground, dull pale green above, sometimes tinged with brown about the neck, which is large, and never surrounded by a hollow; surface little striate; side roots generally numerous, long, but very slender; — foliage very abundant, inclining to erect; — flesh white, core large, translucent cream color; — season late.

An old variety now largely superseded by the White Belgian, which is probably a development from it.

No. 2. ORTHE, VEG. GAR.

Syn. *White Green-Topped d' Orthe*, Vil., '84: Fr., *Carotte blanche à collet vert d' Orthe*, Vil., '84.

A strain of White Belgian differing from it chiefly in growing less above ground and in having a shorter, thicker root, from which cause it may be more readily pulled. It originated with M. J. Roussel, of Orthe, France, who raised it from seed of selected plants of the White Belgian.

Correctly figured in Les pl. pot., p. 69; Veg. Gar., p. 169.

No. 3. TRANSPARENT WHITE, Ben., '83; VEG. GAR.; Vil.

Syn. White Belgian Horn, BURR: Fr., Carotte blanche transparente, VIL.: C. translucide, Vil.

Root conical, regular, growing beneath the soil; well developed samples 2 to 3 in. in diameter, 7 to 9 in. long; skin clear white; surface very smooth; neck small, surrounded by a hollow;—foliage abundant;—flesh white, with a rather large, translucent core;—season late.

A French garden variety distinguished chiefly for the peculiar pure white color of its skin and flesh.

No. 4. WHITE BELGIAN, BURR; Thor., '87; VEG. GAR.; Vil.

Syn. Green Top White, Burr: *Large White Belgian*, HEN.; Sib., '83: *White Green Top*, Vil., '84: Fr., Carotte arbre, Vil.: *C. blanche à collet vert*, VIL., '84: Ger., Sehr grosse weisse grünköpfige Riesen Möhre, Vil.: Holl., Lange witte belgische wortel, Vil.: Span., Zanahoria blanca de cuello verde, Vil.

Root conical or cylindri-conical, growing about ⅓ above ground, rounding to a large neck, which is not surrounded by a hollow; well developed samples 3 in. in diameter, 12 in. long; skin white in the part below ground, green or brown above; surface striate;—foliage very abundant;—flesh white, tending to citron yellow at the heart; not sufficiently fine for table use;—season late.

This is generally considered the most productive variety of carrot, and is the one most grown for stock; though thought by some to be less nutritious than the Long Orange.

Correctly figured in Les pl. pot., p. 69; Veg. Gar., p. 168.

† Root Yellow.

No. 5. YELLOW BELGIAN, Burr; HEN.

Syn. *Large Yellow Belgian*, Sib., '83: Long Orange Green Top, Veg. Gar.: Long Red Belgian, BURR: *Orange Belgian*, VEG. GAR.; Vil., '84: Yellow Belgian Green Top, Vil.: Yellow Green Top Belgian, Burr: Fr., Carotte jaune à collet vert, Vil.: C. rouge longue à collet vert, VIL.: *C. rouge ou jaune longue*, Vil., '84: Ger., Sehr grosse rothe grünköpfige Möhre, Vil.: Holl., Lange gele belgische wortel, Vil.

Root cylindri-conical, growing about ¼ above ground, rounding to a large neck which is not surrounded by a hollow; well developed samples 2 in. in diameter, 12 in. long; skin pale orange below ground, green above; surface striate; side roots considerably developed;—foliage very abundant;—flesh orange, or reddish orange, core rather large;—season late.

A very productive variety largely grown for feeding stock, and considered very nutritious.

Correctly figured in Les pl. pot., p. 66; Veg. Gar., p. 166.

No. 6. YELLOW INTERMEDIATE, Ben., '86.

A long conical variety closely resembling the Long Lemon, and possibly identical with it.

‡ Root orange or red.

No. 7. ALTRINGHAM, Burr; Hen., '87; VEG. GAR.; WHITE.

Syn. Altrincham, BURR (credited to Law); Vil.: *Altringham Long Red*, Sib., '83: Long Red Altringham, Burr (credited to Vil.): *Long Scarlet Altringham*, Vil., '84: Fr., *Carotte rouge longue d'Altringham*, VIL., '84.

Root slender cylindri-conical, often quite irregular, growing 1 to 3 in. above ground; well developed samples 2 in. in diameter, 14 in. long; skin reddish orange below ground, purple or bronze-colored above; surface usually deeply striate; neck small, not set in a hollow;—foliage rather abundant; leaves long but not large nor very numerous;—flesh red throughout, or with a very small heart;—season late.

Of excellent quality, but at present little grown, possibly because of its growing so deep in the soil.

"According to Lawson, it is easily distinguished from the Long Orange by the roots growing more above ground, by its more convex or rounded shoulders, and by its tapering more irregularly, and terminating more abruptly." Burr.

"Derives its name from a place called Altrincham, in Cheshire, Eng., where it is supposed to have originated." Thompson.

Correctly figured in Les pl. pot., p. 66; Veg. Gar., p. 166.

No. 8. LONG ORANGE, BRILL; BURR; Greg., '87; Sib., '83; Thor., '85, '87; VIL.; WHITE.

Root long conical, rather irregular, growing almost entirely below ground, rounding abruptly to a large neck, which is surrounded by a well marked hollow; well developed samples 2½ to 3 in. in diameter, 10 to 12 in. long; skin orange; surface striate, often quite uneven, side-roots few, though sometimes quite large;—foliage very abundant;—

flesh reddish vermillion, or orange, the core lighter and large in proportion to the size of the root;—season late.

Largely cultivated in this country for agricultural purposes.

No. 9. LONG ORANGE IMPROVED, HEN.

Syn. *Improved Long Orange*, Bliss, '83; Greg., '87.

A strain of Long Orange of somewhat deeper color than the ordinary variety. In our tests it proved very productive, but quite variable in form.

Correctly figured in Gar. for Profit, p. 172.

No. 10. LONG SURREY, BURR; VEG. GAR.

Syn. Chertsey, Vil.: James' Scarlet, Burr: Long Red, Burr; Veg. Gar.: Long Red Brunswick (d), Burr: *Long Red Surrey or Long Orange*, Vil., '84: Red Surrey, Vil.: Studley (d), BURR; Vil.: Fr. Carotte longue de Croissy, Vil.: *C. rouge de Flandre*, VIL.: *C. rouge longue*, VIL., '84: C. rouge longue de Toulouse, Vil.: Ger., Frühe lange rothe Möhre, Vil.: Roode Frankforter Wortel, Vil.: Span., Zanahoria encarnada larga, Vil.

Much resembles the Long Orange. The root is rather more slender and deeper colored.

A very hardy and productive variety much grown in Europe for garden and field culture. In France the plants are often covered in the fall with a thin layer of straw or leaves, and left during winter to be pulled as needed.

No. 11. SAINT VALERY, VEG. GAR.

Syn. *Long Red Saint Valery*, Vil., '84: Fr., *Carotte rouge longue de Saint Valery*, VIL., '84.

Root regular, conical, rounding slightly to a small neck which is not surrounded by a hollow; well developed samples 2 in. in diameter, 8 or 10 in. long; skin orange, sometimes dark reddish brown about the neck, and for a short distance below; surface usually distinctly striate;—foliage very abundant;—flesh reddish orange, core rather small, not very distinct;—season late.

"Along with a handsome appearance and good quality, it combines the distinguishing properties of both good kitchen-garden and good field carrots—that is great productiveness, and at the same time a fine, regular shape and thick, sweet tender flesh." Vil.

Correctly figured in Les pl. pot., p. 67; Veg. Gar., p. 167.

|| Root purple.

No. 12. PURPLE, Ben., '83; Burr; Veg. Gar.; Vil.

Syn. Blood Red, Burr; Veg. Gar.; Vil.: *Violet*, Ben., '83: Fr., Carotte noire de l'Inde, Vil.: C. violette, Vil.: Ger., Violette Möhre, Vil.

Root slender conical or fusiform, growing beneath the soil; well developed samples two in. in diameter, ten to twelve in. long; skin dark purple, the shade varying somewhat in different samples; surface usually more or less striate, the slight ridges varying in size in different parts of the circumference, and white where most enlarged; side roots white; neck rather large;—foliage abundant, erect, and with the flowers sometimes tinged with purple;—flesh purple except the heart, which is usually rather large, and colored yellow, fine grained, sweet and well flavored;—season late.

This variety, which appears rather poorly fixed, does not keep well, and when grown on rich soil, frequently runs to seed the first season. It is quite largely grown in some warm countries, but on the whole, must be considered more curious than useful. The flesh imparts an unpleasant brown color to soups and other dishes in which it is used. The plant is said to flourish better than other varieties on wet, heavy soils.

B. Root half long—the length not exceeding four times the diameter.

* Root white.

No. 13. VOSGES WHITE, Veg. Gar.

Syn. *Large Short Vosges*, Vil., '84: Short White, Burr: Fr., *Carotte blanche des Vosges*, Vil., '84: C. Violette, Vil. Ger., Dicke vogesische Möhre, Vil.

Root short conical, growing below ground; well developed samples 4 in. in diameter, 8 in. through the axis; skin white, shading to pale green about the neck, which is small, and often surrounded by a hollow; surface regular, little striate;—foliage abundant, low and spreading;—flesh white or cream colored, sometimes slightly hollow with a large yellowish, irregular, translucent core.

A field carrot adapted to shallow soils. It is productive, easily pulled, and keeps well, but lacks sweetness, and has a rather disagreeable strong taste which unfits it for culinary use.

Correctly figured in Les pl. pot., p. 70; Veg. Gar., p. 168.

‡ Root orange or red.

No. 14. DANVERS, Fer., '83, '84; Greg., '87; HEN.; Thor., '85, '87.

Syn. *Danvers Orange Half Long*, Land., '84, '85.

A strain of the Half Long Pointed carrot extensively grown about Danvers Mass., and in some other localities. It appears closely allied to the English variety, James' Intermediate, but as grown at the Station has not seemed well fixed, as the roots were sometimes blunt and sometimes pointed. It is considerably longer than the Half Long Pointed, and hence more productive, while easier to dig than the Long Orange.

Well figured in Gardening for Profit, (ed. 1887) p. 172.

No. 15. ENGLISH HORN, VEG. GAR.; Vil., '84.

Syn. *Early Half Long Pointed*, Hen., '87: Early Half Long Scarlet, BURR; Veg. Gar.: Early Half Long Scarlet (pointed rooted), HEN.: *Half Long Pointed Rooted*, Vil., '84:© Half Long Red, Burr (credited to Vil.): *Half Long Red Pointed*, Thor., '83, '85, '87:© *Pointed Rooted Early Scarlet Horn*, Land., '86: Fr., *Carotte rouge demi-longue pointue*, VIL., '84: Ger., Halb-lange Zugespitze Treib-Möhre, Vil.: Holl., Half-lang hoornsche wortel —, Vil.: Port., Cenoura d'Hollanda vermelha mediana, Vil.

Root half-long conical, growing mostly below ground, regular, rounding slightly to a rather large neck, which is surrounded by a distinct but narrow hollow; well developed samples 2½ in. in diameter, 7 in. long; skin reddish orange, shading to dull green about the neck; surface striate, with a few rather long, but very slender side-roots; tap-root slender, white;—foliage abundant;—flesh reddish orange, with a perceptible, but not very distinct core;—season intermediate.

A productive variety of good quality.

Correctly figured in Les pl. pot., p. 62; Veg. Gar., p. 163.

No. 16. FLANDERS, VEG. GAR.; Vil.

Syn. Flanders Large Pale Scarlet, BURR: Flanders Pale Red, Burr: *Large Pale Red Flanders*, Vil., '84: Long Orange, Vil.: Sandwich, Vil.: Fr., *Carotte rouge pâle de Flandre*, VIL., '85: Ger., Blassrothe dicke flandrische, Möhre, Vil.

Root irregular conical, growing below ground, rounding more or less abruptly to the small or medium neck; well developed samples 2½ in. in diameter, 9 in. long; skin orange, green or dull purple about the neck; surface deeply striate, with occasional cream-colored warty excrescences and more or less side-roots;—flesh varying in color from yellow to reddish orange, with a large, very distinct, rayed core;—season late.

An old variety from Flanders, seldom grown in this country, though it has merit as a field carrot, as it is rather early, very productive, and keeps remarkably well

Correctly figured in Les pl. pot. p. 67; Veg. Gar., p. 167.

No. 17. NEW INTERMEDIATE, Hen., '87.

This appeared to be an improved form of James' Intermediate, growing more symmetrical, and deeper in the soil, with a very small neck; surface regular, but somewhat striate; side-roots little developed; well developed samples 2 in. in diameter, 8 in. long. A very productive variety; — season intermediate.

The cut in Henderson's catalogue for 1887 represents the form correctly, but the surface is not so smooth as indicated.

No. 18. JAMES'S INTERMEDIATE, H. & W., '85; Sib., '83; Veg. Gar.; Vil., '84.

Syn. New Intermediate? (d), Burr.

Root conical, rounding abruptly to a medium or rather small neck, which is usually not surrounded by a well marked hollow; well developed samples $2\frac{1}{2}$ in. in diameter, 8 in. long; skin orange, green or dark brown about, and sometimes considerably below the neck; surface striate, side roots considerably developed; — foliage very abundant; — flesh rich orange with a more or less distinct core; fine-grained, well flavored, and while young, good for table use; — season intermediate.

"Evidently an improved form of the Half Long Red carrot, but as it has now been a good while in very general cultivation, it has undergone a considerable amount of modification, in consequence of which it exhibits at the present day numerous diversities of character, in different districts. * * * * Up to the present time, this is the most extensively cultivated variety in England, both in fields and gardens." Veg. Gar.

2. Root distinctly præmorse, (blunt at the lower end.)

A. Root long, the length exceeding four times the diameter.

‡ Root orange or red.

No. 19. CORELESS LONG RED, Veg. Gar.

Syn. *Long Red Without Core*, Vil., '84: Fr., *Carotte rouge longue sans cœur*, VIL., '84.

Root distinctly cylindrical, rounding to both ends, often irregular in

outline; well developed samples 1½ in. in diameter, 9 in. long; skin orange, dark brown about, and sometimes slightly below the neck, which is small, and sometimes surrounded by a hollow; surface uneven, often very deeply and densely striate; — foliage scanty; — flesh red, melting, sweet and fine-flavored; — season intermediate.

This is especially a garden variety.

Correctly figured in Les pl. pot., p. 65; Veg. Gar., p. 166.

B. Root half long — the length exceeding two, but not exceeding four times the diameter.

‡ Root orange or red.

No. 20. CARENTAN, Thor., '87.

Syn. *Carentan Half Long*, Thor., '85: Early Carentan, VEG. GAR.: Early Half Long Scarlet Carentan, HEN.: *Half Long Early Carentan*, Vil., '84: *Hal Long Scarlet Carentan*, Sib. '83: Fr., *Carotte demi-longue sans cœur de Carentan*, VIL., '84.

Root cylindrical, regular, inclining to præmorse conical, growing almost entirely below ground, rounding very abruptly to the very small neck, which is set in a more or less distinct hollow; well developed samples 2 in. in diameter, 6 in. long; skin orange, except a small white patch above the tap-root, and a brown or greenish one about the neck; surface usually more or less deeply striate; tap-root very clearly defined, slender, white; — foliage very scanty; — flesh red throughout; — season intermediate.

Distinguished from the Nantes carrot in being more nearly cylindrical, having no core, and by its more scanty foliage.

"Excellent for forcing, and for fine quality and perfect shape can hardly be surpassed." Hen.

Correctly figured in Les pl. pot., p. 63; Veg. Gar., p. 164.

No. 21. CHANTENAY STUMP-ROOTED, Vick, '87.

Syn. *Chantenay Half Long Scarlet*, Greg., '87: *Chantenay Half Long Scarlet Stump-Rooted*, Vil., '87: Fr., *Carrote rouge demi-longue de Chantenay*, Vil., '87.

Resembles the Early Nantes, but is somewhat thicker toward the neck, grows more above ground and is more productive; very symmetrical in form; neck small or medium, surrounded by a hollow; skin orange, brown about, and often for some distance below the neck.

In season it is intermediate, and is specially recommended for table use. It is of French origin, and was first offered in this country in the spring of 1887.

No. 22. EARLY NANTES, VEG. GAR.; Vil.

Syn. *Half Long Scarlet Nantes*, Sib., '83; Vil., 84: Fr., *Carotte demi-longue Nantes*, VIL., '84: Ger., Halblange stumpfe Nantes Möhre, Vil.

A strain of the Half-Long Blunt Scarlet, a little less tapering, rather smaller in diameter and more regular in form; flesh red throughout, almost entirely without core, very sweet and excellent for garden culture. Its finest qualities, however, are only brought out with the best treatment.

Correctly figured in Les pl. pot., p. 63; Veg. Gar., p. 164.

No. 23. HALF LONG BLUNT SCARLET, VEG. GAR.

Syn. *Half Long Red (Stump-Rooted)*, HEN., '87: *Half Long Scarlet (Stump-Rooted)*, Vil., '84, '85; Thor., '83, '87: *Half Long Stump Rooted*, Thor., '85: Fr., *Carotte rouge demi-longue obtuse*, VIL., '84, '85: Ger., Halblange rothe stumpfe Möhre, Vil.

Root præmorse conical, growing mostly below ground, rounding to a very small neck, which is surrounded by a distinct hollow; well developed samples 2 in. in diameter, 5 or 6 in. long; skin reddish orange, sometimes shading to dark brown about the neck; surface rather deeply striate; tap-root well defined, slender, white; — foliage scanty or medium; — flesh reddish orange, with a small or medium sized core; — season rather early.

No. 24. LUC HALF LONG, VEG. GAR.

Syn. *Half Long Luc.*, Thor., '83; Vil., '84: *Luc New Half Long*, Thor., '85: *New Half Long Luc*, Thor., '87: Fr., *Carotte demi-longue de Luc*, VIL., '84.

Resembles the Half Long Blunt Scarlet in its general character, but differs from it in the root being rather longer, thicker at the top, and more inclining to conical; well developed samples 2 in. in diameter, 6 in. long; — foliage abundant; core rather small, not very distinct; season rather early.

Correctly figured in Les pl. pot., p. 64; Veg. Gar., p. 165.

C. Root very short — the length not exceeding twice the diameter.

‡ Root orange or red.

No. 25. EARLY HORN, BRILL; BURR; WHITE; Thor., '87.

Syn. *Blunt Rooted Early Scarlet Horn*, Land., '86: Dutch Horn, Burr: Early Scarlet Dutch Horn, VEG. GAR.: *Early Scarlet Horn*, Burr; Greg., '87; HEN.; Vil.: *Early Scarlet Horn Blunt Rooted*, Ev., '85: *Early Scarlet Short Horn*, Sib., '85: Early Short Dutch, Burr: *Early Short Scarlet Horn*, Vil., '84, '85: *Early Very Short Scarlet?*, Greg., '84, '87: Fr., Carotte de

Croissy, Vil.: C. queue de souris, Vil.: C. rouge courte de Hollande, Vil.: *C. rouge courte hâtive*, VIL., '84, '85: C. vitelotte, Vil.: Ger., Feine rothe kurze stumpfe frühe holländische Möhre, Vil.: Flam., Korte vroege wortel: Holl., Vroege korte broei-wortel, Vil.: Port., Cenoura d'Hollanda vermelha, Vil.

Root short præmorse conical, about twice as long as thick, very regular; well developed samples 2 in. in diameter, 4 in. through the axis; skin orange, dark greenish or brown about the neck, which is very small, and set in a hollow; surface usually densely and deeply striate; tap-root small clearly defined; — foliage very scanty; — flesh deep orange yellow, fine grained, and of good quality; — season very early.

Grown chiefly for bunching in the green state; sometimes used for forcing, but not sufficiently productive for the general crop. On thin soils, however, it often yields as much as the longer varieties.

Correctly figured in Les pl. pot., p. 62; Veg. Gar., p. 162; Field and Gar. Veg. of Am., p. 25.

No. 26. FRENCH FORCING, Vil.

Syn. Earliest Short Forcing Horn, Burr: Early Forcing Horn, Burr: Early Frame (d), BURR: *Early French Forcing*,, HEN., '87: *Early French Scarlet Forcing*, Sib., '83: Early French Short Horn (d), WHITE: Early Red Short Horn, Vil.: Early Short Horn, Veg. Gar.: Early Short Scarlet, Burr: *Extra Early Forcing*, Thor., '87: *French Horn*, VEG. GAR.; Vil., '84: *Golden Ball?* Ev., '85: *Very Early Scarlet Forcing*, Vil., '84: Fr., Carotte á châssis, Vil.: C. carline, Vil.: C. grelot, Vil.: C. rouge très courte à châssis, VIL.: C. toupie, Vil.: Ger., Sehr kurz stumpfe früheste Treib-Möhre, Vil.: Flam., Korte ronde wortel, Vil.: Holl., Allerkorste parijsche ronde broei wortel, Vil.: Dan., Pariser drive guleroden, Vil.: Port., Cenoura redonda de Paris, Vil.

Root very short præmorse conical, growing mostly beneath the soil; well developed samples 2 in. in diameter, 2 to 3 in. through the axis; skin of a half transparent reddish orange, greenish or brown about the neck, which is very small, and surrounded by a hollow; surface rather densely, often deeply striate; tap root clearly defined, very slender, white; — foliage very scanty; — flesh red, fine-grained, mild, and well flavored.

The earliest variety, and the one most used for forcing, for which its small size and scanty foliage especially adapt it.

Correctly figured in Les pl. pot., p. 62; Veg. Gar., p. 162.

No. 27. GARTIER'S RED HORN, Ben., '83; Vil., '84.

This appeared to be a strain of the Early Horn, a little larger in size, and nearly or quite without core.

No. 28. GUERANDE, Greg., '84, '86.

Syn. Blunt-Rooted Guerande, VEG. GAR.: *Guerande Half Long Stump Rooted*, Vil., '84: *New Guerande*, Thor., '87: Fr., Carotte rouge demi-courte de Guerande, Veg. Gar.

Root very short præmorse conical, shaped much like the French Forcing, but of 2 or 3 times its dimensions; well developed samples 3½ in. in diameter, 5 or 6 in. through the axis; skin orange, often white immediately about the slender, well defined tap-root, and greenish or brown about the very small neck; surface deeply striate, often irregular; — foliage medium, or scanty; — flesh orange, not very firm, but tender and well flavored, with a rather large core, sometimes hollow in large samples; — season medium, or rather early.

Correctly figured in Veg. Gar., p. 162.

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RADISH.

In this article the varieties of radish are classified with reference to the form of the root. A plan more often adopted in horticultural works is to divide the varieties into three classes with reference to the season in which the roots are usually used; viz., spring radishes,

summer or autumn, and winter radishes. This method has the advantage of bringing all those varieties together which are planted at the same time, and of which the culture is the same. But as a leading object in offering these descriptions is to furnish a ready means for identifying varieties, it has seemed better to base the classification upon the form of the root, regardless of size or season. For the convenience of those who may desire to know which of the varieties are best adapted to forcing, or open air culture, and for the spring, summer, autumn or winter crop, a list of the varieties best suited to each of these classes is given at the close of the descriptions.

SYNOPSIS OF CLASSIFICATION.

1. Root oblate, spherical or top shaped:
   - A. Root white, Nos. 1-4 inclusive.
   - B. Root yellow, light brown or grayish, Nos. 5-8 inclusive.
   - C. Root red, Nos. 9-14 inclusive.
   - D. Root purple, Nos. 15-16.
   - E. Root black, Nos. 17-18.
2. Root more or less distinctly oval:
   - A. Root white, No. 19.
   - B. Root grayish, No. 20.
   - C. Root red, Nos. 21-27 inclusive.
   - D. Root purple, No. 28.
3. Root conical, or cylindri-conical:
   - A. Root white, Nos. 29-34 inclusive.
   - B. Root grayish, No. 35.
   - C. Root red, Nos. 36-40 inclusive.
   - D. Root purple, Nos. 41-42.
   - E. Root black, No. 43.

DESCRIPTION OF THE VARIETIES.

NOTE.—The leaves are understood to be interruptedly pinnate unless stated otherwise. See note p. 168.

1. Root oblate, spherical or top shaped.

A. Root white.

No. 1. EARLY WHITE TURNIP-ROOTED, BURR,

Syn. *Earliest Short-Topped White*?, Land., '84: Early White, Vil.: *Early White Small Turnip*, Vil., '84: *Early White Turnip*, Thor., '85: *Short Top Earliest White Turnip*?, Land., '86: Small Early White Turnip, VEG. GAR.: Fr., Radis blanc petit hâtif de Hollande, Vil.: R. rond blanc hâtif, Burr: *R. rond blanc petit hâtif*, VIL., '84: Ger., Plattrunde allerfrüheste kurzlaubigste weisse Monats-Radies, Vil.: Holl., Witte radyijis om te broeien, Vil.

Root distinctly flattened, or roundish, growing mostly below ground; white, or faintly tinged with green about the neck; well developed samples $1\frac{3}{4}$ in. in diameter in both directions; surface somewhat roughened about the rather large neck in full grown samples; tap-root very slender and clearly defined; — foliage rather scanty, spreading; leaf segments numerous, small; petioles sometimes slightly tinged with purple above; — flesh white, with more or less translucent rays, very tender; mild in our described samples, though called by Vilmorin very piquant.

Rather less early than the earlier strains of the scarlet turnip-rooted radishes, but sometimes used for forcing.

Correctly figured in Les pl. pot., p. 521; Veg. Gar., p. 487.

No. 2. GIANT STUTTGART SUMMER, Thor., 84, '85.

Syn. *Early White Giant Stuttgart*, Vil., '84: Fr., *Radis blanc géant de Stuttgart*, VIL., '84: Ger., Stuttgarter weisser Riesen-Rettig, Vil.

Root large; conical, becoming top-shaped when full grown, growing below ground; white, sometimes slightly tinged with purple near the very large neck; well developed samples 3 to 4 in. in diameter, 3 in. through the axis; surface more or less striate, the striæ rather prominent, and whiter than the rest of the surface; tap-root thick and often branched; side-roots rather numerous; — foliage very abundant, spreading, rather deep green; leaf segments numerous, often inclining to spoon form, margin sometimes almost entire; petioles often tinged purple above; — flesh white, with distinct translucent rays, somewhat tough and piquant.

The roots may be used quite young, and those remaining will continue to increase in size for many days without losing any of their good qualities.

Correctly figured in Les pl. pot., p. 529; Veg. Gar., p. 493.

No. 3. LARGE WHITE SUMMER, Vil., '85.

Syn. *Large White Summer Turnip*, VEG. GAR.; Vil., '84: Fr., *Radis blanc rond d'été*, VIL., '84, '85: Ger., Früher Weiner weisses Mai-Rettig, Vil.

Root top-shaped, sometimes inclining to roundish, growing mostly below ground; white, sometimes faintly tinged with pale green about the rather small neck; well developed samples 2 to $2\frac{1}{2}$ in. in diameter in both directions; surface slightly striate below, often roughened and scaly about the neck; tap-root rather well defined, long, thick at its junction with the root; — foliage rather abundant, spreading or half erect; leaf segments rather numerous; petioles strong, hairy, some-

times slightly purple above; — flesh white, with translucent rays, very tender, mild, or slightly piquant.

This radish is usually allowed to attain nearly its full size before being used. In season it is rather early among the summer radishes. It appears to be little grown in this country.

Correctly figured in Les pl. pot., p. 529; Veg. Gar., p. 493.

No. 4. WHITE TURNIP-ROOTED, BURR; Vil.; WHITE.

Syn. *White Turnip*, Sib. '83.; VEG. GAR.; Vil., '85; Fr., *Radis rond blanc*, VIL., '85; Ger., Platrunde sehr frühe weisse Monat-Radis, Vil.: Holl., Ronde white radijs, Vil.; Port., Rabao redondo blanco, Vil.

Root less flattened, and more inclined to top-shape than that of Early White Turnip-Rooted. The foliage is also more abundant, and grows more erect and the tap-root, instead of being very slender and clearly defined, is thick and expanded at its junction with the root. The surface is often irregular, and striate about the tap-root. The plant is slower in development, and the root does not become hollow so soon; — flesh white, with translucent rays, moderately tender, mild in our described samples, but called very piquant by Vilmorin. In season it is but little later than the Early White Turnip.

B. Root yellow, light brown or grayish.

No. 5. EARLY YELLOW, Vil.

Syn. *Early Yellow Turnip*, Sib., '83: Small Early Yellow Turnip-Rooted, BURR: Fr., Radis ronde hâtif de tous les mois, VIL.: Ger., Runde gelber Weiner Trieb-Radies, Vil.: Holl., Ronde gele radijs, Vil.: Port., Rabao redondo amarello, Vil.

Resembles the Yellow Summer Turnip, but is smaller in size, much earlier, and with less abundant, distinctly lyrate foliage; skin rather smooth, dull yellow; flesh fine-grained, rather piquant.

This variety is being largely superseded by the Golden Globe.

No. 6. GOLDEN GLOBE, H. & W., '85; Land., '84, '85; Sib., '83.

Syn. *Golden Yellow Turnip*, VEG. GAR.; Vil., '84: *Golden Summer Turnip*, Thor., '85: Fr., *Radis rond jaune d'or*, VIL., '84.

A strain of the Early Yellow, considerably earlier in maturity, with a more regular, more spherical, smoother, smaller necked root, of a brighter and clearer yellow color. The surface is very finely reticulated with whitish cracks when the root is full grown; — foliage distinctly lyrate, the terminal segment very large, oval, margin sometimes nearly entire; — flesh white, with distinct translucent rays, very tender and mild. The finest early yellow radish.

Root and leaves correctly figured in Les pl. pot., p. 522; Veg. Gar., p. 487. The cut called "Yellow Summer Turnip" in Gar. for Profit (ed. 1887), p. 277, is really the Golden Globe.

No. 7. GRAY ROUND SUMMER, Vil., '84, '85.

Syn. Gray Summer, Burr: *Gray Summer Turnip*, HEN.; Thor., '84, '85; VEG. GAR: Gray Turnip-Rooted, BURR: Round Brown, Burr: Fr., *Radis gris d'été rond*, VIL., '84, '85.

Root variable, but usually roundish, or slightly top-shaped; closely resembles the Yellow Summer, with the exception of its color, which is a dull yellow or dirty white, often faintly tinged with pale green about the neck; like the Yellow Summer, the root grows very large, but should be used when about half grown. The season and qualities of the two are the same.

No. 8. YELLOW SUMMER, BRILL; WHITE.

Syn. *Oval Yellow May*, H. & S., '86: *Yellow Summer Turnip*, HEN.; Thor., '84, '85; VEG. GAR.: Yellow Turnip, Vil.; Yellow Turnip-Rooted, BURR: Fr., Radis de Russie, Vil.: R. jaune ou roux d'été, VIL.; Ger., Früher gelber Weiner Mai-Rettig, Vil.

Root globular, sometimes slightly oblong, and sometimes inclining to top-shaped, growing chiefly below the ground; deep yellow, inclining to grayish; surface finely reticulated with white cracks; full grown roots sometimes attain 4 in. in diameter, but they usually become pithy before attaining half this size; surface somewhat scaly about the rather large neck; tap-root well defined, rather thick; — foliage abundant, spreading; petioles little hairy, sometimes tinged purple above; — flesh white, with distinct translucent rays, tender, rather piquant.

"With the exception of the Black Spanish radish, perhaps no other variety has so strong a flavor." Vil.

Figured correctly in Les pl. pot., p. 530; Veg. Gar., p. 494.

C. Root red.

No. 9. EARLY SCARLET ERFURT, Land., 85.

Syn. *Earliest Scarlet Erfurt*, Land., '84: *Earliest Scarlet Erfurt Turnip*, Ben., '86: *Early Scarlet Prussian Globe*, Land., '84: *Erfurt Short-Top Scarlet*, H. & S., '86: *Erfurt Scarlet Short-Top Rose*, H. & S., '86: *Extra Early Roman Carmine*, Thor., '85: Fr., rond écarlate d'Erfurt très hâtif, Ben, '86: Ger., Erfurter Dreien runde scharlachrothe kurzlaubigste, Treib, Ben., '86.

This appeared to be a very early strain of the Scarlet Turnip-Rooted,

differing from it very little in other respects. It appears closely allied to the *Radis rond écarlate hâtif* of Les pl. pot.; (Early Deep Scarlet Turnip of Veg. Gar).

No. 10. EARLY ROUND DARK RED, HEN., '84, '85.

Syn. Deep Scarlet, Vil.: *Deep Scarlet Turnip*, Thor., '84: *Early Deep Scarlet Turnip*, VEG GAR.; Vil., '84: *Garnet Turnip* ?, Land., '84, '85: *Round Rose Red* ?, Dam., '86: Fr., *Radis rond écarlate*, VIL., '84: Ger., Runde scharlachrothe Monats-Radies, Vil.

A strain of the Scarlet Turnip-Rooted, closely resembling the Early Scarlet Erfurt. As grown at the Station the two scarcely differed in color, but in this strain the plant was a little slower in development, and did not become hollow so soon; the flesh was often a little streaked with red, and the petioles were more colored than in the Early Scarlet Erfurt. It is described as being much deeper in color than the Scarlet Turnip-Rooted, but was not strikingly so at the Station. It is an excellent forcing radish.

Correctly figured in Gar. for Profit (ed. 1887), p. 277, Les pl. pot., p. 521; Veg. Gar., p. 436.

No. 11. EARLY SCARLET TURNIP-ROOTED, BURR.

Syn. *Early Scarlet or Red Turnip*, Sib., '83: *Early Scarlet Turnip*, HEN.; Thor., '85; VEG. GAR.; Vil., '84: Early Turnip Rooted Scarlet, Vil.: Fr., Radis rond rose hâtif, VIL., '84.

A strain of the Scarlet Turnip-Rooted, slightly more oblate, with a more slender tap-root, more scanty foliage, and several days earlier in maturing. It also becomes hollow sooner than that variety. A good forcing radish.

No. 12. GARNET TURNIP, Land., '84, '85.

This differed from the Earliest Scarlet Erfurt only in having the root very dark red, inclining to black about the neck.

No. 13. SCARLET TURNIP-ROOTED, BRILL; BURR; Vil.; WHITE.

Syn. Crimson Turnip-Rooted, Burr: Scarlet French Turnip, VEG. GAR.: *Scarlet Turnip*, Vil., '84: Turnip-rooted scarlet French, Vil.: Fr., *Radis rond rose ou saumoné*, VIL., '84: Ger., Rosenrothe runde Monats-Radies, Vil.: Holl., Ronde rose rood radijs, Vil.: Port., Rabao redondo roso, Vil.

Root nearly spherical, somewhat top-shaped when quite small, becoming slightly oblate when full grown, growing mostly below ground; deep scarlet; about 1 in. in diameter when in best condition; surface smooth, tap-root white in the lower $\frac{2}{3}$; — foliage very scanty, grayish

green; petioles somewhat hairy, slightly tinged with red above; — flesh white or faintly tinted with rose, with translucent rays, mild and tender; — season early.

Several more or less distinct strains of this radish have appeared in later years, differing from it more or less in earliness, color and amount of foliage.

Correctly figured in Les pl. pot., p. 520; Veg. Gar., p. 485.

No. 14. WHITE TIPPED SCARLET, HEN.

Syn. *Early Scarlet Turnip (with white tail)*, Thor., '84, '85: Early White-Tipped Scarlet Turnip, Veg. Gar.: *Scarlet Turnip White-Tipped*, Vil., '84: *Sutton's Rosy Gem*, J. & S., '86: Fr., *Radis rond rose à bout blanc*, VIL., '84.

A strain of the Scarlet Turnip-rooted, differing from it in being paler in color, and in shading to white about the tap-root. The upper part of the root is a lively rose color. It is one of the earliest of all radishes, but becomes hollow very soon after attaining its size.

Correctly figured in Gar. for Profit, (ed. 1887,) p. 277; Les pl. pot., p. 520; Veg. Gar., p. 486.

D. Root purple.

No. 15. PURPLE TURNIP-ROOTED, BURR.

Syn. *Early Purple Turnip*, VEG. GAR.; Vil., '84: Early Purple-Turnip-Rooted, Vil.: *Purple Turnip*, Thor., '85: Fr., *Radis rond violet*, VIL., '84: Ger., Violet-rothe Treib-Radies, Vil.: Holl., Ronde violette radijs, Vil.: Port., Rabao redondo violeta, Vil.

Root roundish or slightly oblate, often growing somewhat above ground; clear purple, inclining to black about the neck; well developed samples 1½ in. in diameter in both directions; tap-root slender, very clearly defined, white except near its junction with the root; neck medium to small; — foliage rather abundant, very spreading, deep green; petioles little hairy, tinged with purple above; — flesh translucent, with white rays, or sometimes white, faintly tinged purple, rather piquant, and does not soon become hollow. In season it is about ten days later than the earliest radishes.

No. 16. VIOLET TURNIP WHITE-TIPPED, Hen., '87.

Very similar to the preceding, with the exception that the entire tap-root, with a portion of the skin surrounding it, is white.

E. Root black.

No. 17. BLACK SUMMER TURNIP, Hen., '87.

Syn. *Black Turnip*, Ben., '86: Early Black? (d), Burr: *Small Black Summer*, Vil., '84: Small Black Summer Turnip, VEG. GAR.: Fr., *Radis d'été*

noir rond amélioré, Ben., '86: *R. noir rond d'été*, VIL., '84: Ger., *Runde schwarzer feinlaubiger Sommer-Rettig*, Ben., '86: Schwarzer runder S. R., Vil.

Root top-shaped, inclining to spherical, densely and finely cracked longitudinally, reminding one somewhat of the bark on young ash or hickory trees; black on the outside, the cracks dirty white; the root is also marked with a few whitish transverse lines; tap-root very long, rather thick; neck large;—foliage abundant, grayish green; leaves almost always cut to the midrib, lobes crenate, a shade darker than the very short, hairy petioles;—flesh white, with translucent rays, and a very distinct cambium line, firm but very acrid.

Of medium season, and does not become pithy as soon as many others.

No. 18. ROUND BLACK SPANISH, HEN.

Syn. *Black Round Spanish Winter*, Vil., '84: Black Spanish, Vil.: *Black Spanish Round*, Sib., '83; Thor., '85: Black Spanish Winter Turnip, VEG. GAR.: Fr., Radis de Strasbourg, Vil.: *R. noir gros rond d'hiver*, VIL., '84: Raifort cultivé, Vil.; Raifort d'hiver, Vil.: Ger., Runder grosser Mulhauser Rettig, Vil.; Runder schwarzer Winter-Rettig, Vil.: Holl., Ronde Zwarte rammenas, Vil.

Root roundish or short top-shaped, growing beneath the soil; skin rough, black, with numerous and narrow white cracks; larger specimens sometimes rather deeply cracked longitudinally; surface often striate towards the well-defined but thick tap-root, the striæ prominent and white; neck large;—foliage very abundant, clear or slightly grayish green; leaf segments numerous, extending nearly to apex, often somewhat folded on the midrib, borders undulate, surface of leaves somewhat roughened through the depression of the veins, but scarcely blistered; petioles pale green, sometimes a little tinged with red on the upper side;—flesh white, finely and distinctly rayed, rather tender, very acrid, crisp.

The samples described were about 2 in. in diameter in both directions, but the root often attains 3 in. in diameter.

It is not very late for a winter radish, and keeps well, but is one of the strongest in flavor of all varieties.

A purple strain of this radish is extant, but has not been grown at the Station.

Correctly figured in Les pl. pot., p. 531; Veg. Gar., p. 495.

2. Root more or less distinctly oval.

A. Root white.

No. 19. WHITE OLIVE-SHAPED, VEG. GAR.; Vil., '84.

Syn. Oblong White, Vil.: Fr., *Radis demi-long blanc*, VIL., '84: Ger., Ovate weisse Radies, Vil.

Root regular oval, white in the lower half, with a semi-translucent appearance, faintly tinged with green about the small neck; surface very smooth; tap-root well defined, very slender; — foliage scanty; petioles scarcely paler than the leaves, hairy, sometimes faintly tinged with purple towards the base; — flesh white, translucent, mild and tender; — in season quite early.

This radish may be used either for forcing, or the open ground. Mixed with the scarlet varieties, the roots form a pleasing contrast.

Correctly figured in Les pl. pot., p. 524; Veg. Gar., p. 490.

B. Root grayish.

No. 20. OLIVE GRAY, Sib., '83.

Syn. Gray Olive-Shaped, BURR.

A variety of the olive-shaped radish having a dark brown or grayish skin, which is finely reticulated with whitish cracks. The root grows mostly below ground; tap-root pretty well defined; neck medium; — foliage very abundant; petioles more or less tinted with purple; — flesh pure white, with translucent rays, crisp, tender, and rather piquant; — season early.

C. Root red.

No. 21. CHINESE SCARLET WINTER, VEG. GAR.

Syn. *Chinese Rose*, Sib., '83: Chinese Rose-Colored Winter, Vil.: Rose China Winter, Vil.: Rose Chinese Winter, BRILL: Rose-Colored Chinese, BURR: *Scarlet China Winter*, Vil., '84: *Scarlet Chinese Winter*, Burr; Thor., '83: *Fr., Radis rose d'hiver de Chine*, VIL., '84: Ger., Chinesicher rosenrother Winter-Rettig, Vil.

A very distinct variety. Root short cylindrical, often swollen towards the lower end, very regular, rounding rather abruptly to the neck and to the tap-root; growing 1 to 2 in. above ground; scarlet or rose, mixed a little with russet about the rather large neck; well developed samples 5 in. long, 2 in. in longest diameter; surface very smooth with the exception of some conspicuous white striæ; tap-root remarkably well defined, rather thick, often with an expansion some distance below the root, white, shaded with rose; — foliage distinct, low and spreading, dull green; segments of leaves very numerous, often somewhat folded on the midrib, with irregularly crenate, or nearly entire margins, and undulate borders; petioles scarlet, somewhat glaucous, with a few whitish hairs; — flesh white, with numerous translucent rays, remarkably firm, but very crisp, rather piquant; — season very late.

Correctly figured in Les pl pot., p. 534; Veg. Gar., p. 498.

A purple and a white variety are extant which scarcely differ from the above except in color.

No. 22. EARLY DEEP SCARLET OLIVE-SHAPED, VEG. GAR; Vil., '84, '85.

Syn. Fr., *Radis demi-long écarlate hâtif*, VIL., 84: R. *demi-long écarlate hâtif (forme d'olive)*, Vil., '85.

This might be called a strain of the Olive-Shaped Scarlet, distinguished from it in being a shade deeper in color, the root more regularly oval in form, more blunt at the base, with a more clearly defined tap-root, and especially by its more scanty foliage; the larger leaves being but about 3 in number, and 4 to 6 in. long. In season it is slightly earlier, in quality about the same.

Well suited either for open or forced culture, and one of the most attractive of all the early radishes.

Correctly figured in Les pl. pot., p. 524; Veg. Gar., p 489.

No. 23. EARLY SHORT LEAF, Vil., '85.

Syn. *Half Long Deep Scarlet*, Vil., '85: Short Leaved Early Scarlet Intermediate, VEG. GAR.: *Vick's Early Scarlet Globe*? Vick, '87: *Radis demi-long écarlate très hâtif à courte feuille*, Veg. Gar., Vil., '85.

A strain of the Olive-Shaped Scarlet, somewhat smaller in size, distinguished by its remarkably scanty foliage, and its earliness. The leaves scarcely exceed 3 in. long at the time the root is fit for use, which is nearly as early as in the French Breakfast. Said to succeed best as a forced radish, or when grown in compost or leaf mold.

Correctly figured in Veg. Gar., p. 489.

No. 24. FRENCH BREAKFAST, HEN.; Thor., '85; VEG. GAR., Vil.

Syn. *French Breakfast White Tipped*, Sib., '83: *Olive Scarlet, (incorrectly)*, Sib., '83: Fr., Radis demi-long rose à bout blanc, VIL.: R. demi-long rose de Vaugirarde, Vil.

Root obovate, growing $\frac{1}{3}$ or more out of the ground; deep red except toward the tap-root, where it shades abruptly to white; well developed samples 2 in. long, 1 in. in diameter; surface very smooth; tap-root short and slender; neck very small; — foliage extremely scanty; leaves lyrate; petioles scarcely paler than the leaves, hairy, more or less tinged purple towards the base; — flesh white, with short translucent rays, sometimes faintly tinged with red, very tender, moderately piquant; — season very early, but the root very soon becomes hollow.

One of the best of all varieties for forcing, but not so well adapted for open culture as many others.

Correctly figured in Les pl. pot., p. 523; Veg. Gar., p. 488; Gar. for Profit (ed. 1887), p. 277.

No. 25. HALF LONG DEEP SCARLET, Thor., '85; Vil. '84.

Syn. Deep Scarlet Intermediate, VEG. GAR.: Fr., *Radis demi-long écarlate*, VIL., '84.

A strain of the Olive-Shaped Scarlet, differing from it in being a shade deeper in color, and in having the root more inclined to conical, the tap-root being less clearly defined. The skin is deep dull red above, scarlet in the lower half, shading to white in the tap-root, sometimes a little russet about the neck, which is very small; — flesh white, with some translucent rays, tender and mild, and does not become hollow as soon as some of the olive shaped radishes. The plant is quite hardy, and well suited for open culture.

Correctly figured in Les pl. pot., 523; Veg. Gar., p. 489.

No. 26. OLIVE-SHAPED SCARLET, BURR; HEN.; VEG. GAR.

Syn. Oblong Rose-Colored, Burr: Oval (or oblong) Rose-Colored White: *Scarlet Olive Shaped*, Vil., '84: Fr., Radis demi-long rose, VIL.: R. *demi-long rose (forme d'olive)*, Vil., '84.

Root oval, often quite irregular, sometimes cylindrical and rounding at both ends, growing somewhat above ground; deep carmine red; well developed samples about 1 in. in diameter and 2 in. through the axis; tap-root white except near its junction with the root; rootlets few and slender; neck small; — foliage scanty grayish green, petioles sometimes tinged purple above; — flesh white, with translucent rays, tender and mild, but rather soon becomes hollow; — season early.

The flesh of this variety is called "rose-colored" by Burr, Henderson and White, but it was not so at the Station, nor is it so called by Vilmorin.

Correctly figured in Les pl. pot., p. 523; Veg. Gar., p. 488.

No. 27. WOOD'S FRAME, Burr.

Syn. Early Frame Scarlet, Vil.: *London Particular Long Scarlet*, Greg., '84: *Market Gardener's Early Long Scarlet*, Land., '84: New London Particular, BURR: *Wood's Early Frame*, HEN., '85; H. & W., '85; Thor., '85; VEG. GAR.; Vil.: Fr., Radis long rose, VIL.: Rave rose hâtif à châssis, Vil.

Distinguished from the Long Scarlet by its rather shorter and brighter colored root, its more scanty foliage, and its greater earliness of about 10 days; differences which make it greatly preferred over the latter for forcing, for which purpose it is the one most generally grown.

"Of all radishes, this is the one that gives the largest product in a given time." Vil.

Correctly figured in Les pl. pot., p. 526; Veg. Gar., p. 491.

D. Root purple.

No. 28. PURPLE OLIVE-SHAPED, VEG. GAR.

Syn. *Purple Olive-Shape White-Tipped*, Vil., '84: Violet Olive-Shaped White Tipped, Vil.: Fr., *Radis demi-long violet à bout blanc*, VIL., '84: Ger., Ovale violette Radies untenweiss, Vil.

Root oval, sometimes approaching pyriform, growing slightly out of the ground, blackish purple about the neck, gradually becoming paler until it is pure white about the tap-root; — foliage scanty; petioles usually washed with purple above; — flesh white, with or without translucent rays, rather tough and piquant; — season nearly intermediate between the spring and summer radishes. It is best suited to open culture, but is sometimes used for forcing.

3. Root Conical, or Cylindri-conical.

A. Root White.

No. 29. LANDRETH'S WHITE LADY FINGER, Land., '85.

Syn. *Blunt-Pointed Demi-Long White May*, H. & S., '86: *Ferry's Perpetual Market*, Fer., '83.

This appeared to be an earlier and shorter strain of the Long White Naples, having milder and more translucent flesh. Well developed samples 5 in. long, 1 in. in diameter. It was rapid in development, and slow in becoming pithy.

Figured correctly in Landreth's catalogue of 1884.

No. 30. LONG NORMANDY, VEG. GAR.

Syn. Marsh, Veg. Gar.: *Normandy or Marais*, Vil., '84: Fr., *Rave de Marais*, VIL., '84.

Root long fusiform, growing much out of the ground; white in the lower part, purple where exposed to light; distinct from the fact that the part of the root that grows above ground curves and twists itself as the root becomes full grown. The roots grow rapidly, and when about half developed are excellent for use, but they soon become hollow; grown only in the open ground.

It is of no especial value, and appears to be little known in this country.

No. 31. LONG WHITE NAPLES, Sib., '83; Thor., '85; VEG. GAR.; Vil., '84.

Syn. Long White, Burr; Vil.: Naples, Burr: Vil.: White Italian, Burr; Vil.: White Transparent, Burr; Vil.: Fr., *Radis (ou rave) blanche à collet vert*, Vil., '84: Rave blanche, VIL.: Ger., Lange weisse Radies, Vil.: Ital., Ramolaccio bianco, Vil.

Root nearly of the form and size of the Long Scarlet, usually rather thicker; white shading to pale green about the rather large neck; surface somewhat striate, side roots rather numerous, often extending nearly to the top;—foliage very abundant and spreading; leaf segments very numerous, reaching nearly to the ground;—flesh white, with distinct rays, rather tough and piquant;—in season nearly intermediate between the spring and summer radishes. This variety is always grown in the open ground.

A strain is sometimes met with in which the upper part of the root is tinted with purple.

No. 32. WHITE CROOKED, BURR; Vil., '84.

Syn. Fr., *Rave tortillée du Mans*, Burr; VIL., '84.

Root long cylindri-conical, often irregular, growing much above ground, the part growing below ground often bent or twisted like a cork-screw; well developed samples 10 in. long, 2 in. in diameter; white except about the neck, where it is pale green; neck very large;—foliage abundant; leaves rather short; petioles same color as the leaves, hairy;—flesh white, with translucent rays, rather tough and piquant.

As the root often grows crooked below ground, it cannot be pulled easily when full grown without breaking. An autumn variety little grown in this country.

No. 33. WHITE SPANISH WINTER, Thor., '83; Vil.

Syn. Autumn White, Burr:* *California Large White Winter*, Thor., '85: *Dayton*? Fer., '83: Large White Spanish Winter, VEG. GAR.: *White Large Spanish Winter*, Vil., '84: Winter White Spanish, BURR: Fr., Radis blanc d'Augsburg, Burr: R. blanc d'automne, Vil.: R. de Desbent, Vil.: *R. gros blanc d'Augsbourg*, VIL., '84: Ger., Augsburger langer weisser Winter-Rettig, Vil.: Zuckerhatförmiger weisser Baskiren R., Vil.: Winter weisser langrunder R., Vil.

Root conical, or cylindri-conical; white, sometimes a little russet about the neck; well developed samples 8 in. long, 2½ in. in diameter;

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*Quite distinct from the Californian or Mammoth White Winter radish of the Vegetable Garden (Radis blanc de Californie, of Les plantes potagères). The two varieties are confused in American catalogues, each being sometimes sold for the other.

surface rather thickly striate, side-roots rather numerous, sometimes large; neck large, sometimes surrounded by a slight hollow; — foliage medium, spreading; leaves dark, slightly grayish green, very little blistered, segments rather numerous and narrow; petioles pale green, sometimes tinged purple above, hairy below; flesh white, with numerous translucent rays, rather tough and piquant, though less so than the Long Black Spanish.

An excellent winter radish. The growth is sufficiently rapid so that when sown early it may be used as a summer or autumn variety.

Correctly figured in Les pl. pot., p. 533; Veg. Gar., p. 497.

No. 34. WHITE STRASBURG, VEG. GAR.; Vil., '84.

Syn. *Half Long Strasburg*, Vil., '85: *Long White Autumn?*, Dam., '86: *White Hospital*, Veg. Gar., Vil., '85: *White Strasburg Summer*, Thor., '83, '84: White Summer (d), BRILL: Fr., Radis blanc de l'hospital, Vil.: *R. demi-long blanc de Strasburg*, VIL., '84, '85: Ger., Weisser halblanger Strasburger oder Spitalgarten Rettig, Veg. Gar.

Root long top-shaped, or half long conical, growing mostly below ground; white, sometimes faintly tinged with green about the large neck; surface usually more or less striate below; — foliage very abundant, spreading; petioles scarcely paler than leaves, sometimes faintly tinged with purple above; — flesh white, with translucent rays; — tender, rather piquant.

The roots are fit for use when about $\frac{2}{3}$ grown. Those left will continue to grow for 3 or 4 weeks thereafter without losing their good quality.

Correctly figured in Les pl. pot., p. 530; Veg. Gar., p. 494.

B. Root grayish.

No. 35. LONG GRAY WINTER, Thor., '83.

Syn. *Gray Winter from Laon*, Vil., '84: Laon Gray Winter, VEG. GAR.: Fr., *Radis gris d'hiver de Laon*, VIL., '84.

A strain of the Long Black Spanish, differing from it in the color of the skin, which is brown or grayish, instead of black. The surface is finely reticulated with whitish cracks as in the Black Spanish. Root very regular cylindri-conical, often inclining to præmorse; well developed samples 6 to 8 in. long, $1\frac{1}{2}$ in. in diameter.

The season and qualities are the same as in the Black Spanish.

Correctly figured in Les pl. pot., p. 532; Veg. Gar., p. 496.

C. Root red.

No. 36. BECKERT'S CHARTIER, Hen., '86.

Syn. *Beckert's Improved Chartier*, Thor., '85: *Improved Chartier*, Thor., '86: *Mammoth Long Rose?*, Foote, '86.

Root long conical, growing about 1 in. above ground; crimson at the top, gradually shading to white toward the tap-root; well developed samples $1\frac{1}{2}$ in. in diameter, 10 in. long; surface somewhat striate, the striæ white; neck small; — foliage very abundant, pale green, half erect; leaf-segments rather numerous, often a little folded on the mid-rib, margin irregularly crenate; — flesh white, tender, mild.

Rather early, of excellent quality, and remains in eating order longer than most other varieties. Even the largest roots do not become pithy; but remain crisp and tender throughout.

Introduced in 1885.

Correctly figured in Gar. for Profit (ed. 1887), p. 276.

No. 37. BOSTON LONG SCARLET, Greg., '85, '86.

A strain of Long Scarlet growing rather longer than the ordinary variety; full grown samples 10 in. long, $\frac{3}{4}$ to $\frac{7}{8}$ in. in diameter.

No. 38. LONG SALMON, BURR; Thor., '85.

Syn. Long Scarlet, VEG. GAR.; Vil.: *Long Scarlet Salmon*, Burr; Vil., '84: Salmon, Vil.: Salmon-Colored, Veg. Gar.: *Fr., Radis rose longue ou saumonée*, VIL., '84: Ger., Lange rosenrothe Radies, Vil.: Ital., Ramolaccio rosso, Vil.

Very closely resembles the Long Scarlet, but differs from it in having the root longer, and paler in color. Vilmorin states also as a distinguishing character that the flesh is tinted with pink or lilac, a difference which did not appear at the Station. In their qualities the two are practically identical.

Unfortunately, the name Long Scarlet, adopted for this radish in the Vegetable Garden and given as a synonym of it in Les plantes potagères must tend greatly to confuse the two varieties.

Correctly figured in Les pl. pot., p. 525: Veg. Gar., p. 590.

No. 39. LONG SCARLET, BRILL; BURR (credited to Thompson, not of Vil. or VEG. GAR.).

Syn. *Carter's Selected Long Scarlet*, Greg., '84: *Covent Garden*, Greg., '86: Early Frame, Burr: *Early Long Scarlet*, Sib., '83: *Early Long Scarlet Short Top*, Sib., '83: Early Scarlet Short Top, Burr; WHITE; *Long Scarlet Short Top*, HEN., '85; Thor., '85; VEG. GAR.: *Short Top Long Scarlet*, Land., '86; Fr., Rave rose à collet rond, VIL.

Root long conical, or long fusiform, 1 to 3 in. above ground, in which part the root is often crooked; dark dull red above ground, bright scarlet below; tap-root and side-roots white, the former marked with narrow transverse red stripes, and the latter rather numerous, disposed in opposite longitudinal furrows; surface considerably striate, the striæ often white; foliage very abundant, spreading; leaves occasionally lyrate; petioles somewhat hairy, more or less tinged purple above; — flesh translucent, distinctly rayed with white, very tender, mild, and does not soon become pithy; — season very early.

The samples described were 4 to 8 in. long, $\frac{5}{8}$ to 1 in. in diameter.

Several different strains of this variety are extant, most of which resemble the above in all important respects. It is one of the varieties most generally grown in this country as an early open ground radish.

The seeds of Long Salmon and Wood's Frame are probably often sold for this variety, at least such appeared to be the case in the samples received at the Station.

Correctly figured in Gar. for Profit (ed. 1887), p. 275.

No. 40. SHEPHERD, Ev., '87.

Closely resembles Beckert's Chartier, but is claimed to be earlier, and to run to seed less promptly. In our trial the two were not grown in such a way that they could be compared.

D. Root purple.

No. 41. GOURNAY LARGE PURPLE, Veg. Gar.

Syn. *Purple Large Gournay*, Vil., '85: Fr., *Radis violet d'hiver de Gournay*, VIL., '84.

A strain of the Long Black Spanish, differing from it in little except the color of the skin, which is a very dull reddish brown or purple. It may be considered intermediate between the Long Gray Winter and Black Spanish, and seems very closely allied to, if not identical with, the Large Purple Winter (syn., Purple Spanish) of Burr.

Correctly figured in Les pl. pot., p. 532; Veg. Gar., p. 497.

No. 42. LONG PURPLE, Burr; Thor., '85; Veg. Gar.; Vil., '84.

Syn. Fr., *Rave violette*, VIL., '84: Ger., Lange violette Radis, Vil.: Ital., Ramolaccio violette, Vil.

Root the form and size of the Long Salmon, growing considerably above ground, in which part it is often crooked; blackish purple above, shading to reddish purple in the lower half, tap-root white;

surface smooth, or slightly striate below; neck very small; foliage rather scanty, leaves sometimes lyrate, petioles nearly without hairs, more or less purple above; flesh translucent, with distinct white rays, very tender, slightly piquant, rather soon becomes pithy; — season rather late.

Seldom cultivated except in the open ground. "The seed leaves, which are quite large, are used as a small salad." Burr.

E. Root black.

No. 43. LONG BLACK SPANISH, HEN.

Syn. *Black Long Spanish Winter*, Vil., '84: Black Spanish, BRILL, BURR: *Black Spanish Winter Long*, Sib., '83; Thor., '85: Black Winter, or Spanish, WHITE: *Coal Black Parisian?* Farq., '85: Long Black Spanish Winter, VEG. GAR.: Fr., *Radis noir long d'hiver*, VIL., '84: Ger., Langer schwarzer Erfurter Winter-Rettig, Vil.: Holl., Lange zwarte rammenas, Vil.

Two forms of this radish are in cultivation; in one the root is conical, and in the other it is præmorse conical, or blunt at the lower end; skin thickly striate, which makes it very rough; black except an occasional white mark; side-roots remarkably few; neck very large; — foliage abundant; petioles pale green, smooth, often tinged with purple above; — flesh white, with translucent rays, tender, but quite acrid. Samples described 8 in. long, about 1 in. in diameter, though the variety often attains considerably larger dimensions.

"One of the latest and hardiest, as well as one of the best for winter use." Burr.

The præmorse form is correctly figured in Les pl. pot., p. 532; Veg. Gar., p. 496.

A GROUPING OF THE VARIETIES WITH REFERENCE TO THEIR SEASON.

The following varieties possess qualities that make them especially adapted for forcing:

Early Deep Scarlet Olive-Shaped.
Early Round Dark Red.
Early Scarlet Erfurt.
Early Scarlet Turnip-Rooted.
Early Short Leaf.
French Breakfast.
Garnet Turnip.
White-Tipped Scarlet.
Wood's Frame.

The following are sometimes used for forcing, but are perhaps more used for spring sowing in the open ground:

Beckert's Chartier.
Boston Long Scarlet.

Early White Turnip-Rooted.
Golden Globe.
Half-Long Deep Scarlet.
Landreth's White Lady Finger.
Olive-Shaped Scarlet.
Purple Olive-Shaped.
Purple Turnip-Rooted.
Scarlet Turnip-Rooted.
White Olive-Shaped.

The following, though sufficiently early for spring radishes, are grown almost exclusively in the open ground:

Early Yellow.
Long Salmon.
Long Scarlet.
Long Purple.
Long White Naples.
White Turnip Rooted.

The following grow to a larger size than any of the above, and remain longer without becoming hollow or pithy, and are hence adapted for summer and autumn use. They do not, however, keep sufficiently well for winter use:

Black Summer Turnip.
Giant Stuttgart Summer.
Gray Round Summer.
Large White Summer.
Long Normandy.
White Crooked.
White Strasburg.
Yellow Summer.

The following are slow in development, and keep sufficiently well for winter use:

Chinese Scarlet Winter.
Gournay Large Purple.
Long Black Spanish.
Long Gray Winter.
Round Black Spanish.
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demi-long écarlate 25
demi-long écarlate hâtif 22
demi-long écarlate hâtif (forme d'olive) 22
demi-long écarlate très hâtif à courte feuille 23
demi-long Rose 26
demi-long rose (forme d'olive) 26
demi rose à bout blanc 24
demi-long rose de Vaugirarde 24
demi-long violet à bout blanc 28
gris d'été ronde 7
gris d'hiver de Laon 35
gros blanc d'Augsbourg 33
jaune ou roux d'été 8
long rose 27

Radis noir gros rond d'hiver 43
noir long d'hiver 43
(ou rave) blanche à collet vert 31
rond blanc 4
rond blanc hâtif 1
rond blanc petit hâtif 1
noir rond d'été 17
rond écarlate 10
rond écarlate d'Erfurt très hâtif 9
ronde hâtif de tous les mois 5
rond jaune d'Or 6
rond rose à bout blanc 14
rond rose hâtif 11
rond rose ou saumoné 13
rond violet 15
rose d'hiver de Chine 21
rose longue ou Saumonée 38
violet d'hiver de Gournay 41
Raifort cultivé 18
d'hiver 18
Ramolaccio bianco 31
rosso 38
violette 42
Rave blanche 31
de Marais 30
rose à collet rond 39
rose hâtif à châssis 27
tortillée du Mans 32
violette 42
Ronde gele radijs 5
Rond rose roode radijs 13
Ronde violette radijs 15
Ronde witte radijs 4
Ronde Zwarte rammenas 18
Rose China Winter 21
Rose Chinese Winter 21
Rose-Colored Chinese 21
Rosenrothe runde Monats-Radies 13
Round Black Spanish 18
Round Brown 7
Round Rose Red 10
Runde gelber Weiner Treib-Radies 5
Runde scharlachrothe Monats-Radies 10
Runde Schwarzer feinlaubiger Sommer-Rettig 17
Runder grosser mulhauser Rettig 18
Runder schwarzer Winter-Rettig 18
Salmon 38
Salmon Colored 38
Scarlet China Winter 21
Scarlet Chinese Winter 21

Scarlet French Turnip 13
Scarlet Olive Shaped 26
Scarlet Turnip 13
Scarlet Turnip-Rooted 13
Scarlet Turnip White-Tipped 14
Schwarzer runder Sommer-Rettig 17
Shepherd 40
Short Leaved Early Scarlet Intermediate 23
Short-Top Earliest White Turnip 1
Short Top Long Scarlet 39
Smalt Black Summer 17
Small Black Summer Turnip 17
Small Early White Turnip 1
Small Early Yellow Turnip-Rooted 5
Stuttgarter weisser Riesen-Rettig 2
Sutton's Rosy Gem 14
Turnip-rooted Scarlet French 13
Vick's Early Scarlet Globe 23
Violet Olive-Shaped White-Tipped 28
Violet-rothe Treib-Radis 15

TURNIP.

NOTE. — In the turnip, as in the radish, the most common form of leaf, is inturruptedly, or irregularly pinnate, i. e., the leaf is pinnately divided, but the segments are irregularly disposed, and of unequal size. In a few varieties the leaves are rather distinctly lyrate, i. e. the margin deeply cut, but the incisions not reaching clear to the midrib. In other varieties the leaves are spatulate, with nearly entire margins. In the following descriptions, when the form of the leaf is not mentioned, it is understood to be interruptedly pinnate.

The following classification is adopted in this article:

1. Root distinctly conical, or cylindri-conical.
   - A. Root white, at least in the lower part, Nos. 1–7, incl., also No. 40.
   - B. Root yellow, at least in the lower part, No. 8.
   - C. Root grayish, brown, or black, at least in the lower part, Nos. 9–12, incl.

2. Root more or less distinctly oval.
   - A. Root white, at least in the lower part, Nos. 13–14.
   - B. Root yellow, at least in the part below ground, No. 36.

3. Root spherical, or top-shaped.
   - A. Root white, at least in the lower part, Nos. 15–20, incl.
   - B. Root yellow, at least in the lower part, Nos. 21–23, incl. also No. 28.

4. Root distinctly flattened.
   A. Root white, at least below, Nos. 24–31, incl., also No. 36.
   B. Root yellow, at least below, Nos. 32–34, incl., also Nos. 39 and 41.
   C. Root grayish, brown, or black, No. 35.

DESCRIPTION OF THE VARIETIES.

1. Root distinctly conical, or cylindri-conical.

A. Root white, at least in the lower part.

No. 1. COW-HORN, BURR; Sib., '83; Vil., '84.

Syn. Long White Cow-Horn, BRILL: Long Early White Vertus (Incorrectly), Burr: *Long White Meaux*, Vil., '84: Fr., Navet corne de bœuf, Vil.: *N. de Meaux*, VIL., '84: N. long de Meaux, A. de Cl.: Ger., Lange Ochshorn von Meaux, A. de Cl.

Root rather long cylindri-conical, rounding very slightly to a medium sized neck, sometimes inclining to præmorse below, growing much above ground, very often more or less crooked; white below ground, pale green, cream-color or pinkish above; well developed samples 4 in. in diameter, 10 in. long; surface somewhat striate in the lower half; tap-root often rather well defined; — foliage abundant, deep green; leaves little blistered, usually petioled, segments large, much waved; — flesh white, compact, somewhat dry, rather sweet; — season late.

"As a field turnip it is one of the best, and when pulled young, good for table use. During winter, the roots often become dry and spongy." Burr. "Very valuable for stock, decidedly the best white turnip for family use in winter." Brill.

Correctly figured in Les pl. pot. p. 361; Veg. Gar., p. 581.

No. 2. FRENEUSE, Burr; VEG. GAR.; Vil., '84.

Syn. Fr., *Navet de Freneuse*, VIL., '84: Ger., Weisse von Freneuse Rübe, A. de Cl.

Root conical, growing almost entirely below ground; white except about the neck, where it shades toward green; well developed samples $1\frac{1}{2}$ in. in diameter, 6 in. long; neck small; surface striate in the lower $\frac{2}{3}$; — leaves lyrate or interruptedly pinnate; blistered, midribs greenish white; — flesh white, distinctly rayed, very firm, dry; — season late.

"The most esteemed of the dry-fleshed turnips." Vil.

Correctly figured in Les pl. por., 359; Veg. Gar., p. 580.

No. 3 GREEN TANKARD, BURR; VEG. GAR.

Syn. *Long Green Tankard*, Vil., '84: *Long White Tankard*, Thor., '82; Vil., '84: White Tankard (d), BURR; Vil.: Fr., Navet de campagne, Vil.: N. de Vovincourt, Vil.; N. gros d'Alsace, Burr: N. gros de Berlin, Vil.: *N. gros long d'Alsace*, VIL., '84: N. long blanc d'automne à collet vert, Vil.: Ger., Grünköpfige Ulmer Rübe, Vil.: Lange grünköpfige Herbst-Rübe, A d Cl.: Langeweisse grünköpfige R., Vil.

Root cylindri-conical, growing 1 to 4 in. above ground; white below ground, very pale green, slightly scaly above; well developed samples $2\frac{1}{2}$ in. in diameter, 10 in. long; surface striate below ground, obscurely so above; neck large; — foliage medium, deep green, leaves sometimes lyrate, segments numerous, little blistered, borders undulate; — flesh white, tender, rather watery; — season rather late.

Chiefly cultivated for forage, but when young, good for table use.

Correctly figured in Les pl. pot., p. 361; Veg. Gar., p. 581.

No. 4. LONG WHITE CLAIRFONTAINE, Burr; VEG. GAR., Vil., '84.

Syn. Long White Maltese, BURR: Fr., *Navet de Clairfontaine*, VIL., '84.

Root cylindri-conical or conical, often irregular, usually growing somewhat above ground; whitish below ground, greenish or purplish about the neck; well developed samples $1\frac{1}{2}$ in. in diameter, 6 in. long; surface striate in the lower $\frac{3}{4}$; tap-root often branched; — foliage very abundant, deep glossy green, leaf-segments large, waved; — flesh white, distinctly rayed, tender; — season rather early.

No. 5. LONG WHITE STRAP-LEAF, Thor., '83.

Syn. *Cow Horn Strap-Leaf.*, Thor., '83.

Root conical or cylindri-conical, often growing considerable above ground; resembles that of Cow Horn rather closely except that it is less often crooked, and is considerably smaller in size, well developed samples 7 or 8 in. long and $1\frac{1}{2}$ to 2 in. in diameter; — leaves spatulate, spreading, slightly glossy, blistered, margin shallow erose dentate, rather deeply cut towards the base, border undulate; — flesh white, rayed, firm.

No "strap-leaved" long turnip is mentioned in Les plantes potagères.

No. 6. RED TANKARD, BURR; Vil.

Syn. *Long Red Tankard*, VEG. GAR.; Vil., '84: Fr., Navet d' Ulm., Vil.: N. long à collet rose de Verdun, Vil.: N. long rouge d' Automne, Vil.; *N. rose du Palatinat*, VIL., '84: Rave Rose longue de Brest, Vil.: Ger., Lange rothköpfige Herbst-Rübe, A. de Cl.: Lange weisse rothköpfige Rübe, Vil.: Rothköpfige Bamberger R., Vil.

Root cylindri-conical, growing 2 to 3 in. above ground; white below ground, dull purplish red, mingled with russet above; well developed samples $2\frac{1}{2}$ in. in diameter, 10 to 12 in. through the axis; surface striate below ground, obscurely so above; side-roots very few; tap-root often branched; neck rather large; — foliage very abundant, slightly glossy; leaf segments much waved, deeply dentate or crenate, borders much undulate, sometimes almost ruffled, midribs greenish white; — flesh white, distinctly rayed, tender; — season late.

Correctly figured in Les pl. pot., p. 361; Veg. Gar., p. 582.

"Diffused and esteemed throughout Europe, from Poland to England." Vil.

No. 7. SEVEN-TOP, HEN.; Sib., '83.

A poorly developed variety extensively cultivated in the South for the foliage, which is used for greens.

Foliage medium or abundant, very spreading; leaves interruptedly pinnate, blistered, midribs sometimes much tinged with purple; root short or long conical, irregular, striate; tap-root much branched; side roots numerous; neck large.

Said to be sufficiently hardy to endure the winter in the Southern States.

See also No. 40, Southern Prize.

B. Root yellow, at least in the lower part.

No. 8. LONG YELLOW, VEG. GAR.; Vil.

Syn. *Ottersberg*, H. & S., '86: Small Long Yellow (d), BURR: Fr., Navet jaune long, VIL.: Ger., Gelbe lange Rübe, A. de Cl.: Gelbe lange Ottersberger R., Vil.

Root conical or cylindri-conical, growing mostly below ground; pale yellow throughout or slightly greenish about the neck; well developed samples $1\frac{3}{4}$ in. in diameter, 8 in. long; surface very smooth and regular, finely striate; neck small; — foliage medium, very deep green, slightly glossy; leaf-segments numerous, finely toothed or entire, blistered; — flesh yellow, fine, sweet and well flavored; — season rather late.

The root keeps well; recommended only for table use.

Correctly figured in Les pl. pot., p. 362; Veg. Gar., p. 582.

C. Root grayish, brown or black, at least in the lower part.

No. 9. GRAY LUC, VEG. GAR.; Vil., '84.

Syn. *Navet gris de Luc*, VIL., '86.

Root short conical, growing below ground; dirty white, shading in some specimens to green about the small neck; well developed samples 2 in. in diameter, 6 in. long; surface somewhat striate; — foliage medium, very dark green; leaf-segments numerous, margin little toothed, midribs greenish white; — flesh white, distinctly rayed, firm, dry, resembling that of the Freneuse.

No. 10. MORIGNY GRAY, VEG. GAR.

Syn. *Gray Morigny*, Vil., '84: *Gray Stone*,? Thor., '82: Fr., *Navet gris de Morigny*, VIL., '85: Ger., Graue Morigny Rübe, A de Cl.

Root short conical, rounding gradually to the large neck, sometimes inclining to oval; skin greenish yellow about the neck, dark brown with irregular stripes of dirty white in the rest of the root; well developed samples 3 in. in diameter, 6 in. long; surface thickly striate except about the neck, where it is slightly scaly; — foliage abundant, rather spreading; midribs greenish white, sometimes tinged purple toward the base; — flesh white, distinctly rayed, very firm and crisp.

"Rather early, and a good table variety." Vil.

Correctly figured in Les pl. pot., p. 363; Veg. Gar., p. 583.

No. 11. LONG BLACK, BURR; VEG. GAR.

Syn. *Black Long*, Vil., '84: Fr., Navet noir d'Alsace, Vil.: *N. noir long*, VIL., '84: Ger., Lange schwarze Rübe, A. de Cl.: Schwarze lange mittlefrühe R., Vil.

Root long conical, rounding rather gradually to a very small neck, growing almost entirely below ground; skin dirty white in the lower half, dark brown, approaching black above; well developed samples $1\frac{3}{4}$ in. in diameter, 9 in. long; surface densely striate, somewhat scaly; — foliage medium, deep shining green; leaves finely blistered, borders often nearly entire; petioles nearly or quite clean towards the base; — flesh white, distinctly rayed, very firm.

Correctly figured in Les pl. pot., p. 363; Veg. Gar., p. 583.

No. 12. TELTOW, BURR; VEG. GAR.; Vil.

Syn. *German Teltow*, Thor., '83: *Small Berlin or Teltow*, Vil., '84: Teltau, Burr: Fr., Navet de Belle-Isle, Vil.: N. de Teltau, Vil.: *N. petit de Berlin*, VIL., '84: Ger., Kleine Mark'sche Rübe, Vil.: Markische R., Vil.: Teltauer R., Vil.: Kleine weisse Teltauer R., A. de Cl.

Root conical, not very regular, growing entirely below ground; grayish white; well developed samples 2½ to 3 in. long, 1½ in. in longest diameter; — foliage very scanty; leaves yellowish green with rounded lobes, erect when the plant is young, but falling to the ground and dying when full grown; — flesh dull white, very dry; — season early.

"The root when cooked has a peculiar flavor, completely differing from that of all other turnips. It is milder and more sugary, and the flesh is almost floury instead of being juicy and melting. The roots will keep all through the winter, and far into the following year if taken up and stored in half dry sand." Veg. Gar.

"The peculiar flavor is in the outer rind, and when used, it should not be peeled." Burr.

Correctly figured in Les pl. pot., p. 360; Veg. Gar., p. 580.

2. Root more or less distinctly oval.

A. Root white, at least in the lower part.

No. 13. JERSEY NAVET, Sib., '83; Thor., '83; Vil.

Syn. *Extra Early French?* Greg., '84: Long Early Vertus (Stump), A. de Cl.: *Long Early White Vertus or Jersey*, Vil., '84: Snow White (d), HEN.: *Snow White Olive-Shaped*, Hen., '83: Fr., *Navet long des Vertus Marteau*, VIL., '84: Ger., Frühe lange stumpfe Vertus Rübe, Vil.: Holl., Lange witte Fransche raap, Vil.

Root oblong, oval or cylindrical, swollen toward the lower end, growing about half above ground; white; well developed samples 2 to 3 in. in longest diameter, 5 or 6 in. through the axis; neck small or medium; tap-root well defined; surface somewhat striate; — foliage abundant, slightly glossy; leaf-segments numerous, usually rather small, sometimes spoon-form, midribs nearly white; — flesh white, tender, sweet, and remarkably mild; — season very early.

One of the best varieties for garden culture, either in the open ground or for forcing. The roots should be pulled when about ⅔ grown, as they are liable to become hollow if permitted to attain full size.

Correctly figured in Les pl. pot., p. 359; Veg. Gar., p. 579.

No. 14. WHITE EGG, Greg., '86; HEN.; Sib., '83; VEG. GAR.; VIL.

Root rather long top-shaped, regular, growing about half out of the ground; white; well developed samples 3 in. in diameter, 5 in. through the axis; surface more or less striate; tap-root large and branching; neck large; — foliage very abundant, somewhat glossy;

leaves blistered, midribs nearly white; — flesh white, sweet, mild and of good flavor; — season rather early.

It does not keep well during winter, but is recommended for fall marketing.

Figured correctly in Gar. for Profit (ed. 1887), p. 305.

B. Root yellow, at least in the lower part.

See Dale's Hybrid, No. 36.

3. Root spherical or top-shaped.
A. Root white, at least in the lower part.

No. 15. CROISSY, VEG. GAR.

Syn. *Croissy Oval-Shaped Second Early White*, H. & S., '86: Des Vertus, Veg. Gar.: *Round Early White Vertus*, Vil., '84: Fr., *Navet des Vertus rond ou de Croissy*, Vil., '84: N. rond de Croissy, Vil.: N. rond des Vertus, VIL.: Ger., Weisse runde von Croisse Rübe, A. de Cl.

Root top-shaped or roundish, growing mostly below ground; white throughout, or tinted with pale green about the neck; well developed samples 3 to 3½ in. in diameter, 2½ in. through the axis; surface smooth, or striate toward the tap-root, which is rather clearly defined; neck medium; — foliage abundant, deep green, slightly glossy; — leaf segments large, numerous, inner leaves finely blistered, outer ones coarsely blistered or nearly smooth, midribs greenish white, sometimes clean towards the base; — flesh white, tender, sweet and well flavored; — season early.

One of the best varieties for forcing.

Correctly figured in Les pl. pot., p. 363; Veg. Gar., p. 583.

No. 16. GREEN GLOBE, BURR; Thor., '83.

Syn. *Green Barrel*, Thor., '83: Green-Top White Globe, Burr.

Root globular or slightly oblong, sometimes inclining to top-shaped, very regular, growing about half above ground; white in the lower half, pale green above; well developed samples 5 in. in diameter, 4 in. through the axis; surface very smooth; tap-root usually well defined; neck small to medium; — foliage abundant, half erect; leaves blistered, glossy, segments waved, border undulate, margin distinctly dentate, midribs nearly white; — flesh white, firm; — season early.

A very productive variety, but it does not keep well.

No. 17. GREEN-TOP NORFOLK, VEG. GAR.; Vil.

Syn. Green Norfolk, BURR: Green Round, Burr: *Large Green Globe*, Vil., '84: Fr., *Navet de Norfolk à collet vert*, Vil., '84.

Differs little from the White Norfolk except that the upper part of the root is pale green instead of white. It is said to be rather more regular in form and hardier than the white variety.

No. 18. SNOWBALL, BURR; HEN.

Syn. *Carter's Stone or Stubble*, Greg., '83: *Early Snowball*, Hen., '86: *Early White Six Weeks or Snow*, Sib., '83: *Early White Stone*, Fer., '85: French Snowball, VEG. GAR.: *Nimble Six Weeks*, Greg., '83: Silverball, H. and S., '86: *White Garden Stone*, Sib., '83: *White Gem*, Hen., '86: Six Weeks (d), BURR, with syn. Autumn Stubble and Early Dwarf: White Stone (d), BURR, with syn. Early Stone and White Garden Stone: Fr., Navet boule de neige, VIL.

Root oblate or spherical, sometimes inclining to top-shape and often irregular, growing about half above ground; white throughout; well developed samples 4 in. in diameter, 3 to 4 in. through the axis; surface smooth; tap-root usually well defined; neck medium or large; — foliage very abundant; leaves slightly glossy, smooth or finely blistered, midribs whitish green; — flesh white, tender and of excellent flavor.

This variety is very early, but a very poor keeper. It is useful for sowing very late where earlier sowings have failed, or when ground could not be prepared early, and may be used for either garden or field culture.

THORBURN'S IMPROVED SNOWBALL appeared to be a strain of the above, rather earlier and purer white about the neck.

No. 19. STRAP-LEAVED WHITE GLOBE, VEG. GAR.

Syn. *Landreth's Southern Snow-White Globe*, Land., '86: *Large White Globe Strap-Leaf*, Vil., '84: White Globe Strap-Leaf, A. de Cl.: Fr., *Navet blanc globe à feuille entire*, VIL., '84: Ger., Frühe kugelrunde Amerikanische Rübe, A. de Cl.

Root turbinate or spherical, growing largely below ground; white throughout; well developed samples 4 to 5 in. in diameter in both directions; surface somewhat striate in the lower half; tap-root well defined; neck medium or small; — foliage abundant, rather light, clear green; leaves oblong spatulate, with irregularly toothed margins and undulate borders, surface slightly blistered, midribs greenish white; — flesh very white, tender and mild; — season rather early.

Recommended for field culture.

Correctly figured in Album de Clichés, Vil., No. 48,433.

No. 20. WHITE NORFOLK, BURR; VEG. GAR.; WHITE.

Syn. Cornish White, Vil.: Improved White Pomeranian, Vil.: *Large White Globe*, Vil., '84: *Pomeranian White Globe*, Sib., '83; Thor., '84: *White Flat Norfolk*, Sib., '83: *White Flat or Globe?*, Thor., '83, '86: White Pomeranian, Vil.: White Round, Burr: Fr., Navet de Norfolk, A. de Cl.: *N. de Norfolk blanc*, VIL., '84: N. globe de Pomeranian, Vil.: Ger., Späte von Norfolk Rübe, A. de Cl.

Root spherical or top-shaped, sometimes somewhat flattened and occasionally hollowed about the neck; white; well developed samples 5 in. in diameter, 4½ in. through the axis, sometimes attaining much larger dimensions; surface more or less striate about the tap-root; neck and tap-root large; — foliage very abundant; midribs greenish white; — flesh white, rather coarse-grained, sweet; — season late.

Largely grown for stock.

Correctly figured in Les pl. pot., p. 365; Veg. Gar., p. 585.

Burr describes a Pomeranian Globe, and a White Norfolk as though he considered them distinct, and Morton, in his Cyclopedia of Agriculture describes a Pomeranian White Globe, and a White Norfolk.

B. Root yellow, at least in the lower part.

No. 21. AMBER GLOBE, HEN., '86; VEG. GAR.; VIL.

Syn. *Large Amber Globe*, Fer., '83.

Root varying from distinctly oblate to roundish or top-shaped, growing about half above the ground; light yellow below, pale yellowish green in the upper third; well developed samples 3 to 4 in. in diameter, 2 to 3 in. through the axis; surface very smooth, without rootlets; tap-root well defined, sometimes quite thick; neck large; — foliage very abundant; midribs whitish green; — flesh pale yellow, sweet and mild.

A good variety either for garden or field culture; said to be very popular in the South.

No. 22. GREEN-TOP YELLOW ABERDEEN, BURR; Thor., '85.

Syn. Aberdeen, VEG. GAR.: Aberdeen Yellow, Vil.: Early Yellow Field, Vil.: Green Top Yellow?, Burr, '86: Green-top Yellow Bullock, Burr: Yellow Aberdeen Bullock, Morton: Fr., Navet jaune d'Aberdeen à collet vert, VIL.

Scarcely differs in its external characters from the Purple Top Yellow Aberdeen, except in the color of the upper part of the root which is pale green instead of reddish purple. It also grows rather deeper in the ground.

Much esteemed as a field turnip in England. According to Morton

it is found less productive than the Purple Top variety, but more hardy to endure frost and less liable to mildew in autumn. [Cyclopedia of Agriculture, Article Turnip.]

No. 23. PURPLE TOP YELLOW ABERDEEN, BURR; Thor., '85.

Syn. Berwickshire, MORTON: Border Imperial, Vil., (described as a separate variety by Burr): Eclipse Purple Top, Vil.: Golden Rose? D. of A., '87: Purple-top Aberdeen, Burr: Purple-top Yellow Bullock, Burr: Tweeddale's Improved, Vil.: *Yellow Scotch or Aberdeen*, Sib., '83: Fr., Navet d'Aberdeen à collet Rouge, VIL.

Root roundish or slightly flattened, sometimes top-shaped, growing about $\frac{1}{3}$ above ground; deep yellow below, reddish purple above; well developed samples 5 in. in diameter, 4 in. through the axis; tap-root small; neck rather large;—foliage very abundant, rather spreading; leaves often much blistered and segments much waved, midribs greenish white;—flesh cream-color, shading in samples to nearly white, sometimes finely marbled with white, tender, sweet, and approaching the ruta-bagas in solidity.

"Very hardy, and though generally grown for farm purposes is really superior to many sorts grown for table use exclusively." Burr.

With the Green-Top Yellow Aberdeen, much grown in England for agricultural purposes. Both have been considered by some as hybrids between the turnip and ruta-baga, but M. Vilmorin considers the view poorly founded.

See also No 38, Golden Ball.

4. Root distinctly flattened.

A. Root white, at least below.

No. 24. EARLY DUTCH, VEG. GAR.; Vil.

Syn. Early Flat Dutch, BURR: *Early Stone or Stubble*, Vil., '84: Early White Dutch, Burr: Early White Naples ?, Dam., '86: White Dutch, Burr; Vil.: *White Flat Dutch*, D. of A., '86: Fr., Navet blanc de Hollande, Vil.: N. cœur de bœuf, Vil.: *N. turnep*, VIL., '84: Grosse rave, Vil.: Rabioule, Vil.: Ribouille, Vil.: Ger., Weisse frühe platte Holländische Rübe, Vil.: Holl., Witte Meirapen, Vil.

Root oblate, or top-shaped, growing much below ground; white in the lower part, tinted with green where exposed to light; well developed samples $4\frac{1}{2}$ in. in diameter, 3 to $3\frac{1}{2}$ in. through the axis; surface smooth; tap-root usually well defined; neck medium;—foliage abundant, erect; leaves not much cut;—flesh white, tender and sweet, but lacking in solidity;—season early.

Usually grown for stock, but when young good for table use; not a good keeper.

Correctly figured in Les pl. pot., p. 364; Veg. Gar., p. 583.

No. 25. EARLY FLAT WHITE, Vil.

Syn. Early White, VEG. GAR.: *Early White Flat Dutch Garden*, Vil., '84: Fr., *Navet blanc plat hâtif*, VIL., '84: N. plat hâtif, A. de Cl.: Ger., Weisse frühe platte Rübe, Vil.: Holl., Witte vroege Meirapen, Vil. Probably the White-Top Flat of Burr.

Root very much flattened, the contour often irregular, growing mostly above ground; white throughout; well developed samples 4 in. in diameter and about 2 in. through the axis; neck and tap-root small; — foliage abundant, half erect; leaf-segments numerous, waved, sometimes growing out from the top of the nearly white midrib; — flesh white, tender, not very sweet; — season very early.

Recommended for forced culture as well as for late sowing in the open ground.

Correctly figured in Les pl. pot., p. 367; Veg. Gar., p. 586.

No. 26. JERSEY LILY, Thor., '83.

Resembles in general character the Early Flat White, and may be identical with it; root sometimes slightly hollowed about the neck; skin somewhat striate below. In other respects the resemblance is very close.

No. 27. MILAN STRAP-LEAF, Greg., '86.

Syn. Extra Early Milan (d), HEN.: *Milan Purple-Top Strap-Leaved*, VEG. GAR.; Vil., '84: Fr., Navet de Milan plat très hâtif, A. de Cl.: N. rouge de Milan à châssis, VIL.: *N. rouge de Milan plat très hâtif*, A. de Cl.; Vil., '84: N. rouge très hâtif de Milan à châssis, Veg. Gar.: Ger., Sehr frühe von Mailand Rübe, A. de Cl.

Root very strongly flattened, growing mostly above ground; white in the lower half, reddish purple about the very small neck; well developed samples $3\frac{1}{2}$ in. in diameter, $1\frac{3}{4}$ in. through the axis; surface very smooth; tap-root small, clearly defined; — foliage very scanty; leaves long narrow spatulate, slightly cut towards the base, margin irregularly crenate, midribs greenish white; — flesh white, sweet and crisp.

With the exception of the Purple Top Munich this is probably the earliest variety grown.

Correctly figured in Veg. Gar., p. 578.

No. 28. PURPLE-TOP FLAT, Burr.

Syn. *Earliest Bloomsdale Red Top*, Land., '86: Early Flat Red-Top, Vil.: Early Flat Red Top Garden, VEG. GAR.: *Early Red Top Flat Garden*, Vil., '84: Large Round Naples with Red Top ?, Dam., '86: Red Top Flat' Burr: Fr., *Navet rouge plat hâtive*, VIL., '84: Ger., Frühe platte rothköpfige Rübe, Vil.

Root strongly flattened, growing much above ground; white below, dull purplish red in the upper half; well developed samples 4 in. in diameter, 2 in. through the axis; surface smooth; tap-root clearly defined; neck small; — foliage medium; leaves much cut, midribs nearly white; flesh white, close grained while young, sweet but sometimes bitter; — season very early. The root keeps very poorly.

An old and once very popular variety, now largely superseded by more desirable sorts.

No. 29. PURPLE-TOP MUNICH, Sib., '83.

Syn. *Early Purple-Top Munich*, Vil., '84: *Munich Forcing*, Dam., '86: Fr., Navet de Munich, A. de Cl.: N. plat de Mai, A. de Cl.: *N. rouge plat de Mai de Munich*, VIL., '84: Ger., Münchener Treib-Rübe, Vil.

The root resembles that of the Purple-Top Strap-leaved in form and dimensions, but is more deeply colored in the upper part. It is very much flattened, growing almost entirely above ground, often somewhat irregular in form, frequently hollowed about the neck and sometimes about the tap-root; deep purplish red in the upper $\frac{2}{3}$, white about the tap-root, sometimes beautifully blotched with red and white about the center; neck and tap-root small; skin rough about the former; — foliage abundant or medium, leaves narrow and much cut, midribs sometimes tinged with purple; — flesh white, sweet and mild while young, becoming bitter when the root is full grown.

"Unquestionably the earliest of all turnips, furnishing roots sufficiently large for use twelve to fifteen days earlier than the Early Flat White." Vil.

Correctly figured in Les pl. pot., p. 368; Veg. Gar., p. 587.

No. 30. PURPLE-TOP STRAP-LEAVED, Burr; d. of a., '85, '86; Sib., '83.

Syn. Early Flat Red-Top Strap-Leaved, Vil.: *Early Red Strap Leaf*, *American Stone*, Vil., '84: Early Red Strap-Leaved American, A. de Cl.: Early Red-Top Dutch Strap-Leaved (d), WHITE: Red-Top Strap-Leaf, HEN.: Strap-Leaf Red-Top, BRILL: Red-Top Strap-Leaved American Stone, VEG. GAR.: Fr., *Navet rouge plat hâtif à feuille entire*, VIL., '84: Ger., Frühe platte rothköpfige Amerikanische Rübe, Vil.: Frühe rothköpfige Amerikanische R., A. de Cl.

Differs from the Purple-Top Flat in having entire spatulate leaves, and in being several days earlier. The root is perhaps rather more flattened, and grows rather more above ground; dimensions about the same;—foliage medium, half erect, leaves blistered, margins crenate, borders undulate; petioles winged to the base;—flesh white, sweet, mild and very well flavored;—season very early.

"Unquestionably one of the best of the flat turnips, either for garden or field. It is early, hardy, very prolific, will thrive in almost any description of soil, is of excellent quality, and rarely fails to yield a good crop. It is the best of all the flat turnips for sowing among corn or potatoes." Burr.

"A very suitable variety for frame culture. It has also the good property of forming the roots freely, even when sown in spring, and of being slower to run to seed than most other turnips." Veg. Gar.

Correctly figured in Les pl. pot., p. 368; Veg. Gar., p. 587.

No. 31. WHITE STRAP-LEAF, H. & W., '85.

Syn. Early Flat White Strap-Leaved, Vil.: Early White Dutch (Strap-Leaved), WHITE: *Early White Flat Dutch Strap-Leaved*, Fer., '83: *Early White Strap-Leaved*, Vil., '84: Strap-Leaf Early White Dutch, BRILL: White Strap-Leaved American Stone, VEG. GAR.: White-Top Strap-Leaf, BURR: Fr., *Navet blanc plat hâtif à feuille entire*, VIL., '84: N. hâtif de Mai, Vil.: Ger., Weisse frühe platte Amerikanische Rübe, Vil.

Differs from the Early Flat White in having spatulate rather than interruptedly pinnate leaves. The root is often depressed a little about the neck, and sometimes about the tap-root, and has been described as tinted green about the neck, but was not so in our tests. The contour is rather more regularly rounded than in the early Flat White. The neck is sometimes surrounded by rather prominent striæ, between which the skin is roughened;—foliage medium or rather abundant; somewhat glossy; leaves winged to the base, blistered, coarsely dentate below, crenate above, midribs greenish white;—flesh white, sweet and mild;—season very early.

"The strap-leaved turnips appear to be peculiarly adapted to the climate of the Northern States, and are generally superior in all respects to the common or white and purple top flat varieties." Burr.

Correctly figured in Les pl. pot., p. 367; Veg. Gar., p. 586.

See also No. 36. Early Red-Top Auvergne Flat.

B. Root yellow, at least below.

No. 32. MONTMAGNY, Sib., '83.

Syn. *Montmagny Yellow Purple-Top Flat*, Thor., '85; *Yellow Flat Purple Top Montmagny*, VEG. GAR.; Vil., '84: Yellow Red-Top Montmagny,

A. de Cl.: Fr., *Navet jaune de Montmagny*, VIL.,'84: Ger., Gelbe rothköpfige Montmagne Rübe, A. de Cl.

Root somewhat flattened, often approaching top-shaped, growing about half above ground; pale yellow below, shading to reddish purple about the neck; well developed samples 3 in. in diameter, 2 to 2½ in. through the axis; surface somewhat striate below and about the medium or large neck; tap-root thick; — foliage medium, deep green, spreading; leaves somewhat lyrate, midribs faintly tinged with purple; — flesh pale yellow, tender, of good flavor bfeore full grown; — season rather early.

A productive variety and a good keeper.

Correctly figured in Les pl. pot., p. 371; Veg. Gar., p. 589.

No. 33. YELLOW FINLAND, Burr; VEG. GAR.; Vil., '84.

Syn. Finland, BURR: Petrowskian H. & S., '86: *New Yellow Finland*, Thor., '83: Fr., Navet jaune de Finlande, VIL.: Ger., Finländische gelbe Rübe, Vil.: Gelbe Finländische Rübe, A. de Cl.

Root nearly hemispherical, distinctly concave below, growing largely above ground; yellow throughout; well developed samples 3 to 4 in. in diameter, 1½ to 2 in. through the axis; surface very smooth; tap-root very clearly defined; — foliage scanty; leaves short, approaching lyrate, midribs greenish white; — flesh yellow, tender and mild while the roots are young, but becoming strong and bitter when they are full grown; — season rather early.

Said to be a very hardy variety, and one that is less injured by worms in the roots than most other sorts.

Correctly figured in the Les pl. pot., p. 370; Veg. Gar., p. 589.

No. 34. YELLOW MALTA, BURR; Sib., '83; Thor., '85; Vil., '84.

Syn. Golden Maltese, Burr; Vil.: Maltese, Burr: Yellow or Golden Maltese, VEG. GAR.: Fr., *Navet jaune de Malte*, VIL., '84: Ger., Gelbe frühe Malta Rübe, A. de Cl.: Gelbe frühe platte Malta R., Vil.

Root very much flattened, sometimes slightly concave below; pale yellow, greenish about the small neck; well developed samples 4 in. in diameter, 2 in. through the axis; surface striate about the slender and well defined tap-root, rough about the neck; — foliage rather scanty; leaves blistered and waved, sometimes lyrate, midribs greenish white; — flesh yellow, distinctly rayed, firm, but often rather strongly flavored; — season rather early.

Correctly figured in Les pl. pot., p. 370; Veg. Gar., p. 589.

See also No. 39, Purple-Top Yellow Strap-Leaf, and No. 41, Yellow Dutch.

C. Root black.

No. 35. BLACK STONE, Thor., '83, '86.

Syn. *Chirk-Castle Blackstone*, VEG. GAR.; Vil., '84, '86: Round Black (d), BURR: Fr., *Navet noir rond ou plat*, VIL., '84, '86: Ger., Schwarze plattrunde Rübe, Vil.

Root somewhat flattened when full grown, growing mostly below ground; dark brown, approaching black; well developed samples 3 to 4 in. in diameter, 2 in. through the axis; surface striate about the tap-root, rough throughout from the peculiar scaly structure of the skin, which is finely reticulated with whitish cracks; neck small; — foliage medium, extremely deep green, slightly glossy, leaves scarcely blistered, midribs greenish white; — flesh white, distinctly rayed, firm, rather dry, sweet and well flavored; — season early.

Correctly figured in Les pl. pot., p. 371; Veg Gar., p. 590.

APPENDIX TO THE TURNIP.

The descriptive notes of the following varieties of turnip were not completed until after the preceding article had been written and indexed. The descriptions are therefore inserted here in alphabetical order.

No. 36. DALE'S HYBRID, Ben., '86; BURR.

Root oblong, sometimes inclining to roundish, growing mostly below ground; yellow, greenish about the medium neck; surface very smooth; tap-root small; — foliage very vigorous, with numerous narrow leaf segments; — flesh white, with yellowish specks, tender sweet and mild.

No. 37. EARLY RED TOP AUVERGNE FLAT, Vil., '84, '86.

Syn. Red-Top Auvergne Flat, A. de Cl.: Fr., *Rave d'Auvergne tardif*, VIL., '84, '86: Ger., Rothköpfige von Auvergne Rübe, A. de Cl.

Root very short top-shaped, growing $\frac{1}{3}$ or more above ground; rich purple in the upper half, white below; well developed samples 5 in. in diameter, 3 to $3\frac{1}{2}$ in. through the axis; surface smooth and regular; tap-root well defined, thick; neck large; — foliage of the greatest vigor; leaves glossy, with very large segments, surface strongly blistered; — flesh white, rather coarse and watery.

Grown chiefly for forage.

Correctly figured in Les pl. pot., p. 369.

No. 38. GOLDEN BALL, BURR, Vil.

Syn. *Orange Jelly*, Sib., '83; Vil., '84: Robertson's Golden Stone, BURR; Vil.: *Robson's Golden Ball*, Thor., '82, '85: Yellow Globe, Burr: Fr., *Navet jaune boule d'or*, VIL., '84: Ger., Goldkugel Rübe, Vil.

Root spherical, or when full grown, very slightly oblate, growing mostly below ground; yellow throughout; well developed samples 4 in. in diameter in both directions; surface very smooth; neck medium or small; — foliage medium or rather scanty, very spreading, leaf segments deeply dentate or crenate, midribs sometimes faintly tinged with purple; — flesh yellow, tender, but rather strong flavored; — season medium.

Differs from the Yellow Dutch in being more truly spherical, and in the absence of the green about the neck.

Correctly figured in Les pl. pot., p. 366.

No. 39. PURPLE TOP YELLOW STRAP-LEAF, J. & S., '86.

Root oblate, growing ⅓ above ground; purple in the upper third, pale yellow below; well developed samples 3 in. in diameter, 2 in. through the axis; tap-root well defined; neck medium to large; — foliage vigorous, leaves lyrate, with crenate segments; — flesh yellowish white, with dots and stripes of deeper yellow, tender, sweet and mild.

No. 40. SOUTHERN PRIZE, Thor., '86.

Syn. *Great Southern Prize*, D. of A., '85

Root short conical, inclining to turbinate, growing below ground; white throughout, sometimes purple about the large neck; surface striate but regular; tap-root branching; — foliage abundant, very spreading; leaves sometimes lyrate, clear green, slightly glossy, segments narrow, often twisted or folded; — flesh white, very firm.

No. 41. YELLOW DUTCH, Burr; Vil., '84; WHITE.

Syn. Early Yellow Dutch, BURR: *Golden Stone*, Greg., '83: *Wilhelmsbourg*, H. & S., '86: Yellow Stone (d), Burr; Sib., '83: Fr., *Navet jaune de Hollande*, VIL., '84: Ger., Gelbe frühe plattrunde Holländische Rübe, Vil.: Gelbe Holländische Rübe, A. de Cl.: Holl., Hollandsche gele rapen, Vil.: Platte gele herbstrapen, Vil.

Root oblate, but inclining to spherical, growing slightly above ground; plain yellow below, clear green about the small neck; well developed samples 3 to 4 in. in diameter, 2½ to 3 in. through the axis; tap-root well defined, rather large; surface smooth in the upper half, obscurely striate below; — foliage medium, spreading, rather light green, much cut; — flesh yellow, fine grained, sweet and tender; keeps well; — season medium.

It differs from the Green Top Yellow Aberdeen in the root being smaller and the flesh finer in texture.

Correctly figured in Album de Clichés, No. 48,465.

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ONION.

In this article the varieties of onion are classified with reference first to the form, and second to the color of the bulb. As the varieties are rather numerous, and as the characters vary somewhat under different methods of culture and climatic conditions, this division may prove perplexing in some cases, but no more available method has suggested itself. The Potato onion and top onion are not included in the classified list, but the descriptions of these are appended at the close.

1. Bulb distinctly oblate.
   - A. Bulb white. Nos. 1-12 incl.
   - B. Bulb yellow or brownish. Nos. 13-25 incl.
   - C. Bulb red or reddish. Nos. 26-37 incl.

2. Bulb inclining to spherical.
   - A. Bulb white. Nos. 38-40 incl.
   - B. Bulb yellow or brownish. Nos. 41-43 incl.
   - C. Bulb red or reddish. Nos. 44-48 incl.

3. Bulb inclining to top-shape.
   - B. Bulb brownish. No. 49.
   - C. Bulb reddish. No. 50.

4. Bulb oval or pear-shaped.
   A. Bulb white. No. 51.
   B. Bulb yellow. No. 52.
   C. Bulb red. Nos. 53-54,

DESCRIPTION OF THE VARIETIES.

1. Bulb distinctly oblate.

A. Bulb white.

No. 1. ITALIAN TRIPOLI, VEG. GAR.

Syn. *Giant White Italian Tripoli*, Hen., '85: *Italian White Flat Mammoth*, Ben., '86: Large White Flat Italian, A. de Cl.: *Large White Flat Italian Tripoli*, Sib., '83: *Large White Italian Tripoli*, HEN., '87: *Large White Tripoli*, Thor., '87: *Mammoth Silver King?*, Till., '85: *Silver King?* Ev., '86: *White Flat Italian*, Greg., '87: Fr., Ognon blanc gros plat d' Italie, A. de Cl.: O. gros plat d'Italie, Vil.: *O. de Tripoli blanc plat Mammoth*, Ben, '86: Ger., *Tripoli weisse plat mammoth Zwiebel*, Ben., '86: Weisse grosse späte Italienische Z., A. de Cl.: It., Cipolla Agostena, Veg. Gar.

Bulb very much flattened, sometimes a little concave below; pearly white; well developed samples $3\frac{1}{2}$ in. in diameter, $1\frac{3}{4}$ in. through the axis; neck medium or small; root circle rather large; bulb not very firm; keeps tolerably well; — flavor mild; — season intermediate; — foliage abundant, deep green.

This variety is said to often exceed 6 in. in diameter, but to secure such dimensions in the northern States it is necessary to set out the smaller bulbs the second season.

"It is rather difficult to secure this variety true to name, and it does not appear to be very extensively grown, even in Italy." Veg. Gar.

Correctly figured in Veg. Gar., p. 363; Gar. for Profit, p. 254.

No. 2. MAGGIAJOLA, Damman's catalogue.

Syn. Neapolitan Maggiojola White, VEG. GAR.: *Neapolitan Marzajola*, HEN., '85: *White Flat Maggiojola*, Thor., '87: Fr., Ognon blanc de Juin, VIL.: O. blanc de Mai, Veg. Gar: O. blanc de Mai-June, Vil.

Bulb very much flattened; silvery white; well developed samples 4 in. in diameter, $1\frac{3}{4}$ to 2 in. through the axis; neck rather large; foliage abundant, pale green. A very early variety, but a poor keeper; considered by M. Vilmorin as a smaller and earlier form of the Italian Tripoli.

Correctly figured in Les pl. pot., p. 379.

No. 3. NOCERA, Bliss, '83.

Syn. Early Silver Nocera, BURR: Early Small Silver Nocera, Burr: Early White Nocera, VEG. GAR.; Vil.: White Nocera, Burr: White Nocera Extra Early, A. de Cl.: Fr., Ognon blanc hâtif de Nocera, VIL.: O. blanc très hâtif de Nocera, A. de Cl.: O. de Florence, Vil.: Ger., Früheste Nocera Zwiebel, Vil.: Weisse früheste von Nocera, A. de Cl.

Bulb strongly flattened; silvery white, the inner layers marked with bright green lines; well developed samples 2 to 3 in. in diameter, $\frac{4}{5}$ to 1 in. through the axis; neck small; — foliage very scanty.

A very early variety, but the bulb does not keep well, and except by the greatest care in the selection of seed is quite liable to degenerate. "In spite of all care taken in the choice of the seed a small proportion of bulbs of clear russet or buff color is almost always found." Vil.

Correctly figured in Les pl. pot., p. 377; Veg. Gar., p. 362.

No. 4. PHILADELPHIA WHITE, Greg., '83, '87.

Resembles the White Portugal; bulb strongly flattened; white below, greenish white about the neck, where it is marked with green stripes; well developed samples 3 in. in diameter, $1\frac{1}{2}$ in. through the axis; — foliage medium.

Recommended as a good variety for producing sets.

No. 5. QUEEN, HEN., '85; Thor., '84, 87.

Syn. *Large White Italian Tripoli* (incorrectly), Hen., '87: *New Queen*, Greg., '85, '87; Sib., '83, '85; VEG. GAR.; Vil.: *Very Early White Reine*, Vil., '84: *White Pearl*, Greg., '87: White Very Early Queen, A. de Cl.: Fr., *Ognon blanc très hâtif de la reine*, VIL., '84.

Bulb rather strongly flattened; silvery white; well developed samples $1\frac{1}{2}$ in. in diameter, 1 in. through the axis; neck and root circle very small; outer coat very thin, at maturity loosening from the bulb, exposing a greenish coat below; — foliage very scanty.

One of the earliest of all varieties, but it is by no means productive, and is a very poor keeper. It is of Italian origin. Grown at the Station from Vilmorin's seed, the bulbs inclined to grow larger than the dimensions given in Les plantes potagères.

Correctly figured in Les pl. pot., p. 376; Veg. Gar., p. 361.

No. 6. SILVER-SKINNED, WHITE (Not the Silver-Skin of BURR).

Syn. Early Paris Silver-Skinned, VEG. GAR.: Early Silver-Skin, Burr: Early White Silver-Skinned, Vil.: *Silver-Skin or White?*, Land., '86: Very Early Paris Silverskin, A. de Cl.: *White Early Paris Silver-Skin*, Vil., '84: *White Silver-Skin*, Sib., '83; Fr., Ognon blanc hâtif de Paris, VIL.: O. blanc

très hâtif de Paris, A. de Cl.: O. d'aout, Vil.: Ger., Silberweisse frühe kleine Pariser Zwiebel, Vil.: Silberweisse Pariser frühe Z., A. de Cl.

Bulb rather strongly flattened; silvery or pearly white; resembles that of the Nocera, but somewhat thicker, and clothed with more compact, and more numerous coats; well developed samples $2\frac{1}{2}$ in. in diameter, $1\frac{1}{2}$ in. through the axis; neck small; — foliage medium, rather dark.

Early, keeps moderately well, mild in flavor, much esteemed for pickling.

Correctly figured in Les pl. pot., p. 377; Veg. Gar., p. 362.

This onion is sometimes confounded in American catalogues with the White Portugal.

No. 7. WHITE PORTUGAL, Brill; Greg., '87; Hen., '85; Sib., '83; Thor., '87; Wells, '83 (Not the White Portugal of the VEG. GAR.).

Syn. American Silverskin, Ferry's catalogue: Silver-Skin, BURR; Hen.: White Portugal of New England, Burr.

Bulb rather strongly flattened; silvery white in the outer coats, the third coat often tinted with pale green about the center and toward the small neck; well developed samples 3 in. in diameter, $1\frac{3}{4}$ in. through the axis; root circle very small, often only $\frac{1}{4}$ in. in diameter; bulb firm, rather early, very mild in flavor; — foliage abundant.

A productive variety of superior quality. Under some circumstances it appears to keep well, though generally described as a very poor keeper. The name is frequently confounded with other varieties. Vilmorin gives the White Portugal as an American synonym to the *Ognon blanc rond dur de Hollande*, (White Portugal of the VEG. GAR.), a distinct variety; and the White Portugal of BURR is the *Ognon jaune-soufre d'Espagne*, or White Spanish onion of Vil.

No. 8. WHITE VALENCIA, Vil., '84.

Syn. Early White Valence, VEG. GAR.: White Valence Silverskin, A. de Cl.: Fr., Ognon blanc hâtif de Valence, VIL.: Ger., Silberweise von Valencia Zwiebel, A. de Cl.

Bulb somewhat flattened, sloping rather than rounding to the neck; usually somewhat irregular; pearly white, the outer coat without luster; well developed samples $2\frac{1}{4}$ in. in diameter, and $1\frac{1}{4}$ in. through the axis; neck and root circle large; — foliage medium, light green; bulb moderately firm; does not keep well; — rather early.

Correctly figured in Les pl. pot., p. 378; Veg. Gar., p 362.

The remaining varieties in this division have not been grown since 1883. They may or may not be distinct.

No. 9. EL PASO, Fer., '83.

Syn. *Large Mexican*, Fer., '83.

Bulb much flattened, especially below; silvery white; samples grown at the Station 3 in. in diameter, 2 in. through the axis; neck and root circle very small; bulb firm; flavor mild;—foliage abundant.

It is said that in Mexico, where this variety is a favorite, the bulbs attain a diameter of six inches and a weight of two to three pounds, and that the color varies from white to light red.

No. 10. ETNA SILVER WHITE, Sib., '83.

Bulb very flat below, tapering slightly to the neck; pure white in the lower half, often greenish above, striped about the neck with green; well developed samples 2¾ in. in diameter, 1½ in. through the axis;—foliage very scanty.

No. 11. WHITE CALABRIA, Sib., '83.

Bulb strongly flattened; pure white below, greenish white, and marked with yellow lines about the neck, which with the root circle is very small; well developed samples 2 in. in diameter, 1 in. through the axis; bulb firm;—rather early;—foliage rather scanty.

No. 12. WHITE NAPLES, Sib., '83.

Bulb slightly oblate, tapering a little to the root; white with greenish marks about the rather large neck; well-developed samples 2 in. in diameter, 1½ in. through the axis; root circle very large;—foliage abundant.

B. Bulb yellow or brownish.

No. 13. BEDFORDSHIRE CHAMPION, VEG. GAR.; VIL., '84, '85.

Bulb slightly oblate; of the color of the White Spanish; pale yellow, in some samples inclining toward green, in others toward reddish or brown; well developed samples 3 in. in diameter, 2 to 2½ in. through the axis; neck medium; root circle usually small; outer envelope dry, usually rather adhesive; bulb very firm, keeps well;—foliage very abundant.

No. 14. BROWN SPANISH, VEG. GAR.; Vil.

Syn. Brown Portugal BURR: Cambria, Burr (Not of Vil.): Oporto, Burr; Vil.: Paris Straw-Colored, BURR: Straw-Colored, Vil.: Very Large Straw-colored, A. de Cl.: *Yellow Straw-Colored*, Vil., '84, '85: Fr.,

Ognon blond, Vil.: *O. jaune des Vertus*, Burr; VIL., '84: O. jaune paille, Vil.: *O. jaune paille des Vertus*, Vil., '85: Ger., Gelbe plattrunde harte Zwiebel, Vil.: Strothgelbe platte Vertus Z., A. de Cl.

Bulb strongly flattened; copper yellow, some samples quite glossy, others dull; well developed samples 3 to 4 in. in diameter, 1½ to 2 in. through the axis; neck and root circle rather small; outer coat rather thick and adhesive, second coat sometimes more highly colored than the outer one; inner coats faintly tinted with yellowish green in the upper half; — foliage very abundant.

"Rather early, extremely productive, keeps perfectly well, and is most grown for field culture of any. It is largely used for winter consumption in Paris and in a large part of Europe, and is often seen hanging up in dwelling houses in long bunches formed by the interlacement of the twisted dry leaves." Vil.

Correctly figured in Les pl. pot., p. 380; Veg. Gar., p. 365.

No. 15. COMO FLAT YELLOW, VEG. GAR.

Syn. *Como Yellow Flat*, Vil., '84: Como Yellow Flat Golden Gem, A. de Cl.: Fr., Ognon jaune plat de Côme, Veg. Gar.: Ger., Gelbe platte von Como Zwiebel, A. de Cl.: It., Cipoletta di Como, Veg. Gar.

Bulb strongly flattened, of a copper or salmon-tinted yellow; well developed samples 2½ in. in diameter, 1 in. through the axis; neck small; root circle very small; outer coats very thin; bulb very firm; keeps well; — season very early; — foliage abundant.

Originated at Como, in Lombardy.

Correctly figured in Veg. Gar., p. 364.

No. 16. JAUNE DE VILLEFRANCHE, VEG. GAR.; VIL., '85.

Bulb very much flattened, sometimes concave below; yellowish, or salmon rose; well developed samples 3 in. in diameter, 1½ in. through the axis; outer coat dry, rather thick and strong, inner coats pure white, or slightly tinged green near the neck; bulb very firm; keeps well; — season very early; — foliage medium.

No. 17. NASBEY'S MAMMOTH, Greg., '85, '86, '87.

Syn. Improved Reading (d), Vil.: Nuneham Park (d), Vil.: Nasby Mammoth (d), Vil.:

Bulb somewhat flattened; pale yellow, sometimes inclining to red, usually a shade lighter below; well developed samples 3¼ in. in diameter, 2 in. through the axis; neck large; root circle about ½ in. in diameter; outer coat brittle, little adherent, inner coats slightly tinted

with purple in the upper half; bulb very firm; keeps well; — foliage very abundant.

"A form of the White Spanish onion, with the bulb somewhat thicker and darker colored." Vil.

No. 18. STRASBURG, BURR; Hen., '85, '87; VEG. GAR.

Syn. Deptford, Vil.: Dutch, Burr: Essea, Vil.: Essex, Burr; Veg. Gar.: Flanders, Burr; Vil.: *Large Yellow*, Greg., '87: *Large Yellow Dutch*, Sib., '83: Strasbourg, Vil.: *Strasburg Dutch*, Vil., '84: *Yellow Dutch*, Hen., '85, '87: *Yellow Strasburg*, Burr; Greg., '87; WHITE: Fr., Ognon de Cambria, VIL.: O. de Mulhouse, Vil.: O. jaune de Laon, Vil.: O. jaune paille plat de Flandre, Vil.: O. suisse, Vil.

The Deptford, Syn. Brown Deptford of Burr is described as "Very similar to, if not identical with the Strasburg."

Bulb usually more or less flattened, though sometimes globular; brown, inclining somewhat toward red, second coat pale reddish brown, much tinged with green, inner coats white except near the neck, where they are tinted with green; well developed samples 3 in. diameter, and fully 2 in. through the axis; neck and root circle small; bulb very firm, and an excellent keeper; — medium in season; — very productive.

The bulb of this variety bears a close resemblance to the more flattened forms of the Yellow Danvers, but is usually of smaller size. It is very hardy, and is thought one of the best for winter production at the South; much used for the production of sets.

No. 19. SULPHUR YELLOW, Ben., '86.

Syn. Bambury, Vil.: Cambridge, Burr; Vil.: Portugal, Vil.: Reading, Vil.: White Portugal or Spanish, Burr: *White Spanish*, Ben., '86; BURR; VEG. GAR.; Vil.: Fr., Ognon jaune-soufre de' Espagne, VIL.: O. soufre d'Espagne, A. de Cl.: *O. plat dur jaune soufre d'Espagne*, Ben., '86: Ger., Schwefelgelbe Zwiebel, Vil.: *Schwefelgelbe platte runde Z.*, Ben., '88: Schwefelgelbe Spanishe Z., A. de Cl.

Bulb strongly flattened, of a peculiar brassy-yellow color; well developed samples 3 or 4 in. in diameter, 1½ to 2 in. through the axis; neck medium, root circle very small; coats firm, rather thick, very adherent; bulb very firm, productive, and keeps remarkably well; — season medium; — foliage rather abundant.

Correctly figured in Les pl. pot., p. 381; Veg. Gar., p. 366.

No. 20. TENERIFFE, Greg., '87.

Syn. *Brown Teneriffe*, Thor., '83. *Early Bermuda*, Greg., '87; "*Fegina*" from Teneriffe, 1884: Fr., Ognon de Teneriffe, VEG. GAR.; VIL.

Bulb very small; strongly flattened; pale brownish yellow, shading

toward purple in many samples, sometimes strongly tinted with purple; well developed samples $1\frac{1}{4}$ in. in diameter, $\frac{3}{4}$ in. through the axis; neck and root circle very small; — foliage very scanty.

Resembles the Queen in some respects, but the outer coat is perceptibly thicker, and the flavor less mild. Grown from seed, the bulbs matured slightly later than those of the Queen, and the variety was less productive.

No. 21. YELLOW, BURR.

Syn. *Large Yellow*, Ferry, '83: Silverskin of New England, Burr.

A very old variety allied to the Brown Spanish and probably the parent of the Yellow Danvers. Bulb somewhat flattened; copper yellow, becoming somewhat deeper by age, or if exposed long to the sun; well developed samples 3 in. in diameter, 2 in. through the axis; neck very small; — foliage very abundant. The bulb is very firm, keeps well, and is of mild flavor, and excellent quality. As a market variety it has been very extensively grown in this country.

Correctly figured in Field and Garden Vegetables of America, p. 142.

No. 22. YELLOW RUSSIAN, VEG. GAR.; Vil., '84, '85, '86.

Syn. Russian Yellow, A. de Cl.: *Russian Yellow Hard Improved*, Vil., '87: Fr., Ognon dur de Russie, VIL.: *O. jaune de Russie*, Vil., '84, 85, '86: O. Russe, Vil.: Ger., Gelbe Russia Zwiebel, A. de Cl.

Bulb considerably depressed, inclining to flat on the bottom, rounding to a large neck, frequently growing double, or splitting into cloves; copper yellow, inner coats pure white, sometimes slightly greenish near the neck; well developed samples 3 in. in diameter, 2 in. through the axis; root circle small; outer coats dry, thick and firm; — foliage abundant.

"Very distinct. The bulbs keep better than those of any other variety; sometimes being fit for use nearly or quite a full year. The outer coat becomes with age as brown as a tulip bulb." Vil.

Figured correctly in Album de Clichés, No. 48,507.

No. 23. YELLOW CRACKER, Greg., '83.

Syn. Early Yellow Cracker, Greg., '87.

Resembles the Strasburg, but the bulb is more strongly flattened, being almost flat on the bottom, and decidedly earlier in season.

The remaining varieties in this division, though described separately, may not be distinct.

No. 24. LANDRETH'S GOLDEN, Land., '85, '87.

This proved quite variable in all points except in color, which was coppery yellow, with a slight luster; well developed samples 3 in. in diameter, 1½ to 2 in. through the axis. It bore considerable resemblance to the Bedfordshire Champion.

No. 25. GOLDEN QUEEN, Sib., '83; Thor., '85.

Bulb strongly flattened; dull copper yellow, usually paler toward the root, sometimes inclining to greenish on the top; well developed samples 2¾ in. in diameter, 1½ in. through the axis; neck and root circle medium; outer coat very dry and brittle, little adherent; inner coats faintly tinted with green or purple; bulb very firm, keeps well; in flavor delicate; — in season intermediate; — foliage medium.

C. Bulb red or reddish.

No. 26. BERMUDA, HEN.; Thor., '84.

Syn. *Pale Red Bermuda*, Thor., '85: *Red Pearl*, Thor., '87.

Bulb slightly oblate, sometimes approaching spherical; the dry, rather thick outer coat rather light brown, the second coat rather pale purplish red, inner coats except the center tinted with purple; well developed samples 3 in. in diameter, 2 to 3 in. through the axis; bulb firm; — season, early; — foliage medium or rather scanty; flavor mild; a poor keeper.

"A distinct sort, principally grown in the island of Bermuda, though the seed cannot be grown there. There are two varieties of it, one white and the other pale red. They are both very early, and are the varieties from which as high as 200,000 bags have been shipped from Bermuda in one season. It is now being extensively inquired for by truckers in the South. Great care should be taken in getting the seed genuine." Henderson.

No. 27. BRIGHT RED AUGUST, VEG. GAR.

Syn. *Dark Red August*, Vil., '85: Fr., *Ognon rouge vif d'aout*, VIL., '84: Ger., Carminrothe August Zwiebel, A. de Cl.

Bulb rather strongly flattened, inclining to flat on the bottom; rather pale dull red, inner coats tinged purple in the upper half; well developed samples 3¼ in. in diameter, and 1¾ in. through the axis; neck and root circle rather small; — season medium; keeps well; — foliage abundant.

Correctly figured in Les pl. pot., p. 384; Veg. Gar., p. 369.

No. 28. BRIGHT RED MEZIERES, VEG. GAR.; Vil., '87.

Syn. Fr., Ognon rouge large de Metz, Vil.: *O. rouge vif de Mézières*, Vil., '87: Ger., Carminrothe von Mezieres Zwiebel, A. de Cl.

Bulb large; strongly oblate, almost flat below, rounding slightly to the rather large neck; outer coat brownish, little adherent, second coat very bright rich, glossy red, inner coats tinted with red in the upper half; well developed samples $3\frac{1}{2}$ in. in diameter, 2 in. through the axis; root circle small; bulb very firm, flesh tender, moderately sweet, mild.

A very productive variety. The bulbs are attractive in appearance, and keep well.

Correctly figured in Les pl. pot., p. 384; Veg. Gar., p. 368.

No. 29. EXTRA EARLY RED, Hen., '87; Sib., '83; Wells, '82, '83.

Syn. *Early Flat Red*, Greg., '87: *Early Red Flat*, Thor., '84, '87: Early Red Wethersfield (d), BURR: *Extra Bloomsdale*, Land., '84: *Extra Early*, Wells, '82 or '83: *Extra Early Bloomsdale Red?*, Land., '85: Extra Early Flat Red, HEN.; Vil.

Bulb strongly flattened, bright rich red, shading in spots to deep purple, with a metallic luster in places; outer coat thin and fragile, inner coats tinted with purple toward the small neck; well developed samples 3 in. in diameter, $1\frac{3}{8}$ in. through the axis; root circle small; bulb firm; keeps well; moderately strong flavored;—foliage medium;—season very early, coming into use nearly 2 weeks earlier than the Wethersfield.

A popular variety for early market use, probably developed by selection from the Red Wethersfield.

EARLY RED GLOBE, Greg., '87, bore a very close resemblance to the above, the only difference being that the bulbs were very slightly thicker.

No. 30. FLAT MADEIRA, Thor., '83, '85.

Syn. *Flat Brown Red Tripoli*, Dam., '86: Flat Tripoli, VEG. GAR.; Vil.: *Giant Red Italian Tripoli*, Hen., '85, '87: *Large Red Italian Tripoli*, Sib" '83: Tripoli, BURR: Fr., Ognon de Madère plat, VIL.: O. de Montfrin, Vil.: O. de Tripoli, Vil.: Ger., Madeira grösste platte Riesen-Zwiebel, Vil.: Platt-runde Riesen-Madeira Z., A. de Cl.

Bulb strongly flattened; dull purplish red, or brownish below, paler about the large neck, second coat pale red, inclining to purple below, inner coats tinged with purple about the neck; well developed samples 6 in. in diameter, 2 in. through the axis; root circle very large; bulb soft, and a very poor keeper; flavor mild and delicate;—foliage medium.

This variety requires a long season, and the dimensions noted above

are probably not often secured in the Northern States, where it is less reliable for crop than many others.

Correctly figured in Les pl. pot., p. 386; Veg. Gar., p. 370.

No. 31. FRENCH PALE RED, Vil., , 84.

Syn. Common Pale Red, VEG. GAR.: Fr., *Ognon rouge pâle ordinaire*, Vil., '84: Ger., Hellrothe gewohnliche Zwiebel, A. de Cl.

Bulb considerably flattened; light brown, shading in some specimens to copper red, the second and third coats a shade deeper, inclining to purple; well developed samples 3 in. in diameter, $1\frac{1}{4}$ in. through the axis; neck rather large; — season intermediate; — foliage rather abundant, but short, clear green.

Hardy, and keeps pretty well, though it sheds its outer coat readily; much grown in France.

Correctly figured in Les pl. pot., p. 383; Veg. Gar., p. 367.

No. 32. GIANT ZITTAU, VEG. GAR.

Syn. *Yellow Giant Zittau*, Vil., '84: Fr., *Ognon Géant de Zittau*, VIL., '84: Ger., Gelbe Zittauer Riesen Zwiebel, A. de Cl.

Bulb oblate; pale salmon color; well developed samples 4 in. in diameter, 2 to $2\frac{1}{2}$ in. through the axis; neck and root circle small; outer coats very smooth and silky; — foliage very abundant.

A productive, firm, good keeping variety of medium season.

Correctly figured in Les pl. pot., p. 382: Veg. Gar., p. 367.

No. 33. NIORT PALE RED, VEG. GAR.

Syn. Pale Red, BURR: *Pale Red Niort*, Vil., '84: Fr., *Ognon rouge pâle de Niort*, Burr; VIL., '84: Ger., Hellrothe von Niort Zwiebel, A. de Cl.

Bulb rather strongly flattened; pale pink, slightly tinted with copper color, inner coats somewhat tinted with purple; well developed samples 3 in. in diameter, $1\frac{1}{2}$ in. through the axis; neck and root circle rather small; outer coats rather thin; — season medium; flavor rather strong; bulb very firm; keeps well; — foliage very abundant, clear green.

Correctly figured in Les pl. pot., p. 383; Veg. Gar., p. 368.

No. 34. WETHERSFIELD, VEG. GAR.; Vil.

Syn. *Large Red*, BURR; Thor., '85, '87; WHITE: *Large Red Wethersfield*, BRILL; Burr; Ferry, '83; HEN., '85; Sib., '83; Wells, '83: *Wethersfield Red*, Land., '86: Fr., Ognon rouge de Wethersfield, VIL.

Bulb oblate, but not much flattened, very regular; dark purplish red, slightly glossy, often with patches approaching black, and sometimes a

little metallic luster near the very small neck; inner coats stained purple in the upper half, those near the outside sometimes stained nearly to the root; well developed samples 3 in. in diameter, 2 in. through the axis; outer coat dry, rather adhesive, second rather thick and strong; root circle very small; bulb very firm; one of the best keepers and one of the most productive of all varieties; strong in flavor; — season medium; — foliage medium.

A standard variety, and a favorite in the Eastern States, where immense quantities are grown for shipment to the South and West. Named from Wethersfield, Conn.

"This onion was originally entirely spherical. Now it is rarely found, even in America, except with a somewhat flattened form, and when the original form is met with, it is called Large Red Globe Onion." Vil.

Correctly figured in Gar. for Profit, p. 251. A very fine colored plate appeared in Ferry's catalogue, 1883.

The remaining varieties in this division have been grown but once, and hence are not pronounced as being certainly distinct.

No. 35. ETNA PALE RED, Sib., '83.

Bulb much flattened; salmon rose; well developed samples 3 in. in diameter, $1\frac{1}{2}$ in. through the axis; neck small, root circle medium; bulb firm; — foliage abundant.

No. 36. MAMMOTH COPPER KING, J. & S., '86.

Bulb more or less flattened, often irregular; copper red; well developed samples $2\frac{3}{4}$ in. in diameter, $1\frac{3}{4}$ in. through the axis; neck medium; root circle rather large; bulb rather firm; a fair keeper.

No. 37. RED GENOA, Sib., '83.

Syn. *Red Bassano of Genoa*, Sib., '83.

Bulb rather strongly flattened; pale red, sometimes inclining to purple, inner coats purple about the neck, lilac below; well developed samples 3 in. in diameter, $1\frac{1}{2}$ in. through the axis; neck and root circle very small; — season rather early; — foliage rather scanty.

2. Bulb inclining to spherical.

A. Bulb white.

No. 38. ROUND WHITE SILVERSKIN, Ferry's Catalogue.

Syn. *Early White Round*, Vil., '84: *White Dutch?*, Vil., '84: White Portugal, VEG. GAR.; Vil.: White Round Early Hard Dutch, A. de Cl.: White Round Hard Dutch, Vil.: Fr., *Ognon blanc rond dur de Hollande*, VIL., '84: Ger., Runde harte weisse Holländische Zwiebel, Vil.: Silberweisse Holländ rund harte Z., A. de Cl.: Holl., Zilverwitte winter nijen, Vil.

Bulb spherical, but inclining to conical above; dull white; well developed samples 2 in. in diameter, 1½ in. through the axis; neck and root circle medium to small; — season medium; — foliage scanty.

Differs from most other white onions in the thickness of its outer envelopes. These are strong and opaque instead of being thin and fragile and almost transparent, as in many others. It keeps nearly as well as the best keeping red varieties, and the bulbs do not become green on exposure to light, as do many other white onions. It is moderately productive.

Correctly figured in Les pl. pot., p. 378; Veg. Gar., p. 363.

No. 39. WHITE GLOBE, BURR; Sib., '83; Vil., '85.

Syn. Globe Silverskinned, VEG. GAR.: *Southport White Globe*, HEN., '85: Fr., *Ognon blanc globe*, VIL., '84: Ger., Weissekugelrunde Zwiebel, A de Cl.

Very similar to the Red Globe, except in its color, which is silvery white, sometimes slightly greenish; inner coats pure white, or faintly tinted with green; well developed samples 3 in. in diameter, 2¾ in. through the axis; neck medium, root circle small; bulb firm, keeps fairly well; — foliage very abundant.

"A great favorite in the New York market." Hen.

Correctly figured in Les pl. pot., p. 379; Veg. Gar., p. 364.

No. 40. WHITE LISBON, BURR; Sib., '83; VEG. GAR.; Vil.

Syn. Early Lisbon, Burr: Florence, Vil.: Lisbon, Burr: White Florence, Burr: Fr. Ognon blanc d' Espagne, Vil.: O. blanc gros, VIL.: Ger., Lissaboner weisse grosse runde Zwiebel, Vil.: Französische or Spanische weisse Z., Vil.: Weisse dicke runde späte Z., A. de Cl.

Bulb nearly spherical, being usually slightly flattened, often irregular; white; well developed samples 3 to 4 in. in diameter, 2½ to 3 in. through the axis; neck and root circle rather large; bulb not firm; does not keep well; — season late; — foliage abundant, light green.

"Most often used green, even in the South. In England it is cultivated in immense quantities for use when quite young, when the bulbs are scarcely larger than a walnut." Vil.

Correctly figured in Les pl. pot., p. 379; Veg. Gar., p. 364.

B. Bulb yellow or brownish.

No. 41. YELLOW DANVERS, Sib., '83; Vil.; Wells, '83; WHITE.

Syn. Danvers, BURR: *Danvers Yellow*, Burr; Land., '86; VEG GAR.: *Danvers Yellow Globe*, Sib., '83: *Early Round Yellow Danvers*, Greg., '87: Large Yellow Globe, Vil.: *Round Yellow Danvers*, Hen., '87: *Yellow Globe Danvers*, HEN., '85; Thor., 85, '87; Till., '87: Fr., Ognon jaune de Danvers, Vil.: Ger., Gelbe von Danvers Zwiebel, A. de Cl.

Bulb spherical, or slightly oblate; light yellowish brown below, paler, sometimes greenish yellow in the upper half, second coat pale yellowish brown in the lower half, dull yellowish brown above; inner coats pure white except near the neck, where they are faintly tinged with pale yellowish green; well developed samples 3 in. in diameter, $2\frac{3}{4}$ in. through the axis; neck medium; root circle $\frac{3}{8}$ to $\frac{1}{2}$ in. in diameter; bulb very firm, and an excellent keeper; flavor mild; — season medium or rather early; very productive; — foliage rather scanty.

Originated at South Danvers, Mass., prior to 1850, through selection from the yellow, or Silverskin onion of New England. It is one of the most popular varieties for field culture in this country. Some seedsmen recognize two strains, in one of which the bulb is nearly or quite spherical, and in the other quite oblate. The original form, however, was spherical.

Correctly figured in Les pl. pot., p., 380; Veg. Gar., p. 365.

No. 42. YELLOW GLOBE, BURR; Thor., '87.

Syn. *Southport Yellow Globe*, HEN., '85.

Scarcely different from White Globe except in its color, which is light yellowish brown, sometimes inclining to greenish toward the neck; inner coats pure white or faintly tinged green in the upper half; well developed samples 3 in. in diameter in both directions; neck rather large; root circle small; bulb firm, keeps well; very productive and of excellent quality; — foliage abundant.

Correctly figured in Gar. for Profit, ed. 1887, p. 252.

No. 43. YELLOW TREBONS, VEG. GAR.

Syn. Large Yellow Trebons, A. de Cl.: *Trebons Large Yellow*, Vil., '84: Fr., *Ognon jaune de Trébone*, VIL., '84: Ger., Gelbe grosse von Trebons Zwiebel, A. de Cl.

Bulb roundish, but perceptibly tapering toward the neck and root; pale yellow, or flesh color, second coat bright yellow; well developed samples $2\frac{1}{2}$ in. in both directions; neck small; — flesh tender, mild and sweet; bulb moderately firm, keeps rather poorly; — foliage abundant.

"Raised in the neighborhood of Tarbes in the Hautes Pyrenées, but it is poorly fixed, even in its own country." Vil.

Correctly figured in Les pl. pot., p. 382; Veg. Gar.

C. Bulb red, or reddish.

No. 44. EARLY RED GLOBE, Greg., '87.

Syn. *Red Globe Early*, Fer., '83.

This appears to be a globular form of the Extra Early Red, maturing nearly as early as that variety; well developed samples 3 in. in diameter; neck small; flesh mild and tender; bulb very handsome in appearance.

No. 45. GIANT ROCCA, HEN., '85; Thor., '85, '87; VEG. GAR.: Vil.

Syn. *Giant Rocca of Naples*, Sib., '83: Large Brown Globe, Vil.; Fr., Ognon géant de Rocca, VIL.: Ger., Rocca Riesen Zwiebel, Vil.

Bulb somewhat variable as grown at the Station from seed, being sometimes slightly oblate, tapering more or less distinctly to the root; and at others rather oblong oval; rather light reddish yellow, with little luster; inner coats slightly tinged purple near the medium to large neck; well developed samples about 3 in. in diameter in both directions; root circle rather large; outer coat rather thick and brittle, little adhesive; bulb rather soft, and a poor keeper; mild; — foliage medium or rather abundant.

"To obtain the largest growth, the smallest bulbs should be set out the next spring, when they will continue increasing in size, instead of producing seed, as is the case with American onions." Ferry's catalogue, 1887.

The cut given in Ferry's catalogue of 1882 more nearly represents this variety as grown at the Station, than the one in Les pl. pot., p. 387; Veg. Gar., p. 371.

No. 46. GLOBE MADEIRA, Thor., '83, '85.

Syn. *Giant Red Italian Tripoli*, Hen., '85: Globe Tripoli, VEG. GAR.; Vil.: Large Globe Tripoli, Burr: *Large Red Italian Tripoli*, Sib., '83: Madeira, BURR; Veg. Gar.: *Mammoth Pompeii?*, Till., '85: *Mammoth Tripoli*, Greg., '87: Fr., Ognon de Bellegarde, Burr; Vil.: O. de Madère rond, Burr; VIL.: O. Gros brun, Vil.: O. Romain, Burr; Vil.: Ger., Madeira grösste runde Reisen-Zweibel, Vil.: Runde Riesen Madeira Z., A. de Cl.

Bulb spherical, or slightly oblong, sometimes tapering slightly toward the root; salmon rose, or light copper red; inner coats tinted with purple toward the large neck, elsewhere pure white; well developed samples as grown at the Station from seed, 4 in. in diameter in both directions; outer coat thin and fragile, not adhesive; root circle large, though not large in comparison to the size of the bulb; the latter is soft and a very poor keeper, but remarkably sweet and mild in flavor; — foliage rather abundant, clear green.

Under favorable conditions this variety is said to have attained a diameter of seven inches. It succeeds especially in warm climates, where it is esteemed for its large size and sweet taste. It is not much grown in the northern states.

Correctly figured in Les pl. pot., p. 386; Veg. Gar., p. 370.

No. 47. RED GLOBE, H. & W., '85; Sib., '83.

Syn. *Large Red Globe*, Thor., '85: *Large Red Globe Southport*, Hen., '85: *Southport Late Red Globe*, Greg., '87: Southport Red Globe, HEN.

Bulb spherical, or very slightly oblate; purplish red, slightly glossy, shading in places to nearly black in the upper half, with small spots having a metallic luster, second coat a shade lighter, but still often nearly black about the neck, inner coats tinted with purplish red in the upper half, and sometimes in the lower half also; rather small; well developed samples $3\frac{1}{2}$ in. in diameter in both directions; root circle about $\frac{1}{2}$ in. in diameter; — foliage abundant.

A very productive variety, having a firm bulb that keeps well. In season it is rather late, but may be successfully grown in all except the most northern states. It is thought by M. Vilmorin to be a globular form of the Wethersfield.

The cut of "Southport Large Yellow Globe" onion, Gar. for Profit, p. 252, would represent the Red Globe quite as well.

The following variety has been grown but once, and is not pronounced as being certainly distinct.

No. 48. GIANT SANGUINIA, Dam., '86.

Bulb spherical, or slightly flattened, dull copper red; well developed samples $3\frac{1}{2}$ in. in diameter, $2\frac{1}{2}$ in. through the axis; neck rather small; root circle large; bulb soft; a poor keeper.

3. Bulb inclining to top-shape.

B. Bulb brownish.

No. 49. ST. LAURENT, A de Cl.

Syn. *Large Brown St. Laurent*, Vil., '87; Fr., Ognon de St. Laurent, A de Cl.: *O. jaune brun de St. Laurent*, Vil., '87: Ger., St. Laurent Zwiebel, A. de Cl.

Bulb large, rather light brown, with reddish longitudinal marks, second coat pale green, inner coats white, tinted with green near the large neck; well developed samples 3 in. in diameter, $2\frac{1}{2}$ through the axis; root circle medium; flavor rather strong; — season very late; — foliage very abundant.

A very productive variety. Its keeping qualities have not yet been tested.

Correctly figured in Album de Clichés, No. 48,505.

C. Bulb reddish.

No. 50. JAMES'S KEEPING, BURR; Vil., '84; VEG. GAR.

Syn. James's Long Keeping, Burr: Fr., *Ognon de James*, Burr; VIL.,'84.

Bulb copper color, second coat reddish brown; well developed samples 2 in. in diameter, $2\frac{1}{2}$ in. through the axis; neck very small; flavor strong; — season early; — foliage abundant.

Though much prized in England for its long keeping, this variety failed to keep well at the Station.

"Originated by a Mr. James, an extensive market gardener in Surrey, England." Burr.

4. Bulb oval, or pear-shaped.

A. Bulb white.

No. 51. PEAR-SHAPED WHITE, Vil., '84.

Syn. White Pear-shaped, VEG. GAR.: Fr., *Ognon piriforme blanc*, VIL., '84.

Bulb much the shape of a pear with the stem downward, rounding to a large neck, but tapering regularly to the root; white, without luster in the outer coat, sometimes faintly tinged with yellow or pink in spots; well developed samples grown at the station from seed, $1\frac{5}{8}$ in. in diameter, $2\frac{1}{4}$ in. through the axis; bulb firm; — season late; keeps well; — foliage extremely abundant.

The form of this onion is well illustrated by the figure in Les pl. pot., p. 388; Veg. Gar., p. 371.

B. Bulb yellow.

No. 52. PEAR-SHAPED EARLY YELLOW, Vil., '87.

Syn. Fr., Ognon jaune piriforme hâtif, Vil., '87: Ger., Frühe gelbe Birn-Zwiebel, A. de Cl.

Bulb pyriform, or regularly oval; skin pale yellow, the outer coat scarcely adherent; well developed samples 2 in. in diameter, 3 in. through the axis; neck and root circle very small; flesh white, firm, very sweet, mild; — season intermediate.

Correctly figured in Album de Clichés, No. 48,535.

C. Bulb red.

No. 53. PEAR-SHAPED, Burr; Vil.

Syn. Fr., *Ognon piriforme*, Ben., '86; VIL.: O. piriforme rouge, A. de Cl.: Ger., Birn-Zwiebel, Vil.: Frankische lange Z., Vil.: Rothgelbe lange Birn-Z., A. de Cl.

Very similar to the Pear-Shaped White except in its color, which is copper red; well developed samples $2\frac{1}{2}$ in. diameter, $4\frac{3}{4}$ in. through the axis; bulb firm, keeps well; of good quality, but late.

Correctly figured in Les pl. pot., p. 388; Veg. Gar., p. 371.

No. 54. PYRAMID OR VESUVIUS, Till., '85.

Bulb oval, often tapering slightly to both ends; dull pale red, second coat rather rich glossy purple, sometimes shading to nearly white below, inner coats pure white or cream tinted; well developed samples measure $2\frac{1}{2}$ in. in both directions; neck and root circles rather large; outer coat thick, brittle, somewhat adhesive; bulb very soft, and a poor keeper; — foliage rather scanty.

No. 55. POTATO ONION, Brill; Burr; Hen.; Veg. Gar.; Vil.; White.

Syn. Underground onion, Burr: Fr., Ognon patate, VIL.: O. sous terre, Vil.: Ger., Kartoffelzwiebel, Vil.; Holl., Aradappel Uie, Vil.

Distinct in producing neither seed nor bulblets on the stalks, but instead the bulb set into the ground in spring divides into 4 to 10 cloves or bulbs of varying size. These when well developed are $2\frac{1}{2}$ to 3 in. in diameter, and $1\frac{1}{2}$–2 in. through the axis; copper yellow, with a rather thick skin; mild and sweet.

The earliest dry onions are usually obtained from this variety. It does not keep well, but is said to keep best when the tops are cut off two or three inches above the bulb at the time of harvesting.

Correctly figured in Vick's catalogue, 1883, and later years.

No. 56. TOP ONION.

In 1883 a few bulbs bearing the above name were purchased at a seed store, from which the plants differed in some respects from either the Egyptian or Catawissa onion as described by Vilmorin, though they chiefly resembled the latter. They produced bulblets at the top of the stem, and some of these produced secondary bulblets. But in addition to these flowers and seeds were also formed, the peduncles growing out from between the bulblets. With the exception of the latter peculiarity the resemblance to Vilmorin's description of the Catawissa onion was quite close.

The seeds from some of the plants were planted the following spring. They germinated and produced bulbs of fair size, which formed neither seeds nor bulblets on the top of their leaves. The bulbs were copper colored, about 2 in. in diameter and about the same through the axis,

tapering toward the neck and root; they were moderately firm, and did not keep very well.

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CELERIAC.

The varieties are few in number, and differ chiefly in the amount of foliage and in the size and neatness of the roots, the latter being almost entirely enveloped in side roots in less improved varieties, and tolerably free from them in those more improved. The varieties described appear fairly distinct.

[The history of Celeriac is particularly interesting, as we seem to have a record of its first introduction, and of a size at that time which is not approached in modern culture.

Jo. Baptista Porta, a Neapolitan, thus writes in his "Villæ, lib. XII.," published at Frankfurt in 1592, lib. X., chap. XXI, De palustri apio and capitato, the translation being liberal:

"There is another kind of celery called Capitatum, which is grown in the gardens of St. Agatha, Theano and other places in Apulia, granted from nature and unseen and unnamed by the ancients. Its bulb is spherical, nearly of the size of a man's head. It is very sweet, odorous and grateful. Except in rich land, it degenerates, until it differs from the common apium (smallage?) in no respects, except in its root, round like a head."—E. L. S.]

DESCRIPTION OF THE VARIETIES.

No. 1. APPLE, Thor., '83; Vil., '84.

Syn. Apple Shaped, VEG. GAR.: *Apple Shaped Small Leaved*, Vil., '87: Dwarf Apple Shaped, HEN.: *New Apple*, Thor., '84, '85: Fr., *Céleri-rave pomme à petite feuille*, VIL., '84, '87; Ger., Runder kurzläubiger Apfelknoll-Sellerei, Vil.

Root slightly depressed; very smooth, with few side roots; about ½ thicker than the neck; foliage dwarf, very deep green; leaflets not blistered, inclining to spoonform; petioles rather flat, deep green, with a very broad furrow above, which in some plants is tinged with purple; the outer petioles are sometimes much washed with red; flesh white, with translucent rays, tender.

The root in this variety is more neatly formed than in any other tested.

Correctly figured in Les pl. pot., p. 77; Veg. Gar., p. 191; Gar. for Profit, ed. 1887, p. 190.

No. 2. COMMON, VEG. GAR.

Syn. *Turnip Rooted Celeriac*, Thor., '84: Turnip Rooted Celery, Veg. Gar.: Fr., Céleri rave ordinaire (d), VIL.: Ger., Leipziger Knoll-Sellerei, Vil.: Naumburger, K. S., Vil.

Root roundish or conical in the upper part, dividing into numerous

more or less fleshy and tangled ramifications; well developed samples 2 in. in diameter; — foliage more vigorous than in most other varieties, but less developed than in celery; petioles hollow, more or less tinted with red or bronze, neck nearly as thick as the root.

Correctly figured in Gar. for Profit, ed. 1887, p. 189; Les pl. pot., p. 77; Veg. Gar., p. 191.

No. 3. ERFURT, Vil., '84.

Syn. Early Erfurt, VEG. GAR.: *Erfurt Giant*, Hen., '87: *Erfurt Large Early*, Sib., '85; Vil., '87: *Erfurt Short Leaved*, H. & S., '86: *Large Early Erfurt*, Hen., '84: Fr., *Céleri-rave d'Erfurt*, VIL., '84, '87: Ger., Erfurter Knoll-Sellerie, Ωil.

Root considerably depressed, slightly thicker than the neck, somewhat smaller than that of the Smooth Paris, rather smooth above, rooty below; — foliage inclining to upright, stems strong, tapering, more or less tinged with purple on both sides; — flesh tender, sometimes hollow in the center.

No. 4. PRAGUE, VEG. GAR.

Syn. *Giant Prague*, Ωil., '84: *Giant Smooth Prague*, Vil., '85: Fr., *Céleri-rave géant de Prague*, Ωil., '84, '85.

Root large, considerably depressed, inclining to flat on the bottom, tapering rather slowly to the neck, which is nearly as thick as the root; side-roots very few, but base roots large and numerous; well developed samples 2½ in. in diameter, 1½ in. through the axis; — foliage spreading, rather scanty, very deep, but dull green, with a somewhat leaden tint; — leaflets short and broad, smooth, usually nearly flat; petioles more slender than those of the Erfurt, somewhat washed in the furrows with purple; — flesh white, with translucent rays.

"May be described as a highly developed form of the Erfurt." Veg. Gar.

No. 5. SMOOTH PARIS, VEG. GAR.

Syn. *Large Smooth Paris*, Vil., '84, '85: Fr., *Céleri-rave gros lisse de Paris*, VIL., '84, 85.

Roots usually slightly depressed, thicker than the neck, and fairly symmetrical, though considerably enveloped in rootlets; — foliage dwarf, rather spreading; the broad furrows on the upper side of the rather numerous petioles usually strongly tinged purple.

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The figures refer to the number of the variety in the described list.

[Synonyms are printed in Italics.]

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Erfurt 3
Erfurt Giant 3
Erfurt Large Early 3
Erfurt Short Leaved 3
Erfurter Knoll-Sellerie 3
Giant Prague 4
Giant Smooth Prague 4
Large Early Erfurt 3
Large Smooth Paris 5
Leipziger Knoll-Sellerie 2
Naumburger Knoll-Sellerie 2
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Smooth Paris 5
Turnip Rooted Celeriac 2
Turnip Rooted Celery 2

CELERY.

From the names in our seed catalogues, the varieties of celery would appear to be rather numerous. As a matter of fact, however, those that are clearly distinct are quite few. In the following described list the attempt has not been made to discriminate between clearly marked varieties and strains. For convenience the so-called "red" or "pink" varieties are grouped by themselves, as are the self-blanching sorts. The term red, as applied to celery, tends to confusion, as none of the varieties are more than partially colored red, and others called red are but very slightly tinted.

DESCRIPTION OF VARIETIES.

A. Stems neither self-blanching nor tinted with red.

No. 1. BOSTON MARKET, Breck, '85; Evt., '85; Fer., '83; Greg., 86; Sib., '83; VIL.; VEG. GAR.

Rather closely allied to the Sandringham, from which it differs in being slightly taller and in being more given to suckering. The very numerous solid stems blanch nearly white, are of superior quality, and keep very well during winter.

Very popular in the neighborhood of Boston, and in some other localities. Quality excellent.

No. 2. CRAWFORD'S HALF DWARF, Greg., 86.

Syn. ? *Crawford's Half Dwarf White*, Thor. '83, '85: Early Dwarf Solid White (d), WHITE: *Henderson's Half Dwarf*, HEN., '85: Fr., Célerie pleine blanc (d), VIL.

Stems of medium length and number, growing erect, entirely solid, blanching promptly to a yellowish white, and of superior quality;—season somewhat earlier than the Boston Market.

Very largely grown for the New York market.

No. 3. CURLED SOLID WHITE, VEG. GAR.

Syn. *Curled?*, H. & S., '86: *White Solid Curled*, Vil., '84: Fr., *Céleri pleine blanc frisé*, VIL., '84: Ger., Weisser krausblättriger, Bleich-Sellerie, Vil.: Vollrippiger krausblättriger Sellerie, A. de Cl.

Very distinct from its curled foliage, which is clear, or rather pale green, decidedly glossy, with remarkably broad, deeply cut, much blistered leaflets, which have undulate, sometimes almost ruffled borders, and the segments are more pointed than in most other varieties. "The stalks are thickish and perfectly solid, and the leaves, instead of being bitter, like those of other kinds, have a mild flavor, and can be used in salads. This new variety was raised in the neighborhood of Niorte (Vendée), and began to be distributed about the year 1870." Veg. Gar.

In our experience at the Station this variety appeared somewhat difficult to blanch well.

Correctly figured in Les Pl. Pot., p. 74; Veg. Gar., p. 188.

No. 4. DWARF SOLID WHITE, VEG. GAR.

Syn. Dwarf Large Ribbed Solid, Vil.: *Dwarf Large Ribbed White Solid*, Vil., 84: Large Dwarf Solid White, Vil.: Fr., *Céleri pleine blanc court à grosses côtes*, VIL., '84: Ger., Niedriger weisser breitrippiger Sellerie, Vil.: Vollrippiger dicker niedriger weisser S., A. de Cl.

Plant dwarf, compact, with numerous very broad, solid, erect stems which are crisp, mild and tender; — foliage deep green, with large, oblong, blistered, more or less twisted leaflets, which are often somewhat spoon-form. "The stalks are more largely developed in proportion to the dimensions of the leaves in this variety than in any other." Veg. Gar.

Correctly figured in Les Pl. Pot., p. 75; Veg. Gar., p. 189.

No. 5. FERN-LEAVED, Dam., '86.

Syn. *Carter's Fern-Leaved*, H. & S., '86: *New Fern-Leaved*, Burpee, '86; J. & S., '86.

Very distinct; leaves finely divided into narrow linear segments, which are slightly curved, but are not twisted. The stems are numerous, but very slender, often hollow, and very poor in quality.

No. 6. GIANT WHITE SOLID, BRILL; Thor., '83, '85.

Syn. ? *Large White Solid*, Land., '86: *Mammoth*, Dam., '86: Mammoth White (d), VEG. GAR., Vil.: Turkey or Prussian (d), Burr: Fr., Céleri Turc (d), VIL.

♂ A very vigorous, tall-growing celery, of which the plant often attains a height of 2 ft. or more. The stalks are solid, thick and long, but are not readily blanched in the upper part. Comparatively little grown at the present time.

No. 7. GOLDEN DWARF, Sib., '83; Land., '86.

Syn. Henderson's Golden Dwarf (d), HEN.: *New Golden Heart Half Dwarf?*, Thor., '83, '85.

Similar to Crawford's Half-Dwarf, but the heart blanches to a beautiful waxen, golden yellow, making it very attractive in appearance. It is solid, keeps very well, is of superior quality, and is one of the most popular of all varieties.

No. 8. SANDRINGHAM, HEN.

Syn. Dwarf Solid White, VEG. GAR.: Dwarf White Solid, BRILL; Vil.: *Henderson's Dwarf White*, Hen., '85: Incomparable, Veg. Gar.: Incomparable Dwarf White, Vil.: *Sandringham Dwarf*, Greg., '86; Sib., '83: *Sandringham Dwarf White*, Land., '86; Thor., '85: *Turner's Dwarf White*, Sib., '83: *Turner's Incomparable*, Greg., '86: Fr., Céleri pleine blanc court hâtif, Vil.

Plant stocky, with numerous broad, perfectly solid, half round, stems, which blanch readily to a yellowish white, and are crisp, tender and of very fine flavor.

Said to have originated in the garden of the Prince of Wales. A.

superior variety where it can be grown without blight, to which it is more subject than many others.

No. 9. SOUP, VEG. GAR.; Vil., '84.

Syn. Small Dutch, BURR: Fr., Céleri à couper, VIL.: *C. à couper petit*, Vil., '84: C. creux, Vil.: C. fin de Hollande, Vil.: Ger., Schnitt Sellerie, Vil.: Gerwöhnlicher Schnitt Sellerie, A de Cl.: Flam., Snijselderij, Vil.: Span., Apio de cortar, Vil.: A. pequeno, Vil.

A variety of celery apparently but little improved from the wild state, grown for the leaves, which are used in flavoring. At the Station, the foliage was quite variable, the stems often hollow, and the suckers very numerous. It is said that the foliage grows again when cut.

Correctly figured in Les Pl. Pot., p. 76; Veg. Gar., p. 190.

Besides the varieties above described, the following have been tested, most of which appeared not clearly distinct.

No. 10. EARLY ARLINGTON, Greg., '85, '86.

Allied to Boston Market, but more vigorous, and three or four weeks earlier.

No. 11. LA PLUME CHESTNUT, Greg., '83, '86.

Resembles Crawford's Half Dwarf; has a superior nutty flavor; a very good variety.

No. 12. PERFECTION HEARTWELL, Greg., '86; Sib., '83; Thor., '85.

A very vigorous variety, apparently allied to Crawford's Half Dwarf.

No. 13. SEALEY'S LEVIATHAN, Vick, '85.

Apparently closely allied to Giant White Solid, if not identical with it.

No. 14. SEYMOUR'S SOLID WHITE, Sib., '83.

A large growing celery resembling Giant White Solid.

No. 15. SOLID IVORY, Greg., '84, '86.

Similar to Sandringham, but blanching perfectly white.

No. 16. WHITE CURLED GIANT OF NAPLES, Dam., '86.

Allied to the Fern Leaved, but the leaves less finely divided.

No. 17. WHITE SKAGIT, Till., '85.

A white celery of rather feeble growth. Stalks narrow at the base, tapering gradually; very mild in flavor; a poor keeper.

No. 18. WHITE WALNUT, Thor., '83, '85.

Somewhat resembles Crawford's Half Dwarf. Stems medium in size, little furrowed, very crisp, tender and mild.

B. Stems not self-blanching, but more or less washed or tinted with red.

No. 19. CARTER'S CRIMSON, Greg., '83.

Syn. Carter's Incomparable Crimson, Vil.: *Dwarf Crimson*, Sib., '83: *Hood's Dwarf Red*, Hen., '84; Vil.: *Incomparable Dwarf Crimson*, Thor., '85.

Closely resembles the Dwarf Red Solid, if not identical with it. Described by Vilmorin as being less solid than the other red celeries.

No. 20. HENDERSON'S ROSE, HEN.

Syn. *Henderson's New Rose*, Hen., '85, '87: *New Rose Dwarf*, Greg., '87.

This appears to be closely allied to the Red Solid, but the plant is perhaps rather more Dwarf; the quality is excellent.

No. 21. LAING'S MAMMOTH RED, Ben., '83.

Syn. Giant Red. Vil.: Laing's Improved Mammoth Red (d), BURR: Laing's Mammoth (d), Vil.: Manchester Red (d), VIL.; VEG. GAR.: Sutton's Prize Pink, Vil.: *Sutton's Sulham Prize?*, Ben., '83.

A very vigorous variety, of which the stems are somewhat tinted with red; of good quality, and has been described as the largest celery in cultivation.

No. 22. MAJOR CLARK'S PINK, Hen., '83, '86.

Probably identical with Major Clark's Solid Red, Vil. (Syn., Wilcox's Dunham Red, Ramsey's Solid Red, Turmos Red).

A variety of vigorous growth, with deep green foliage, and slightly tinted stems; of excellent quality.

No. 23. RED GIANT SOLID, Vil., '84.

Seemed closely allied to Carter's Crimson. The stems were a little more tinged with red, which was the only difference observed.

No. 24. RED SOLID, BURR; WHITE.

Syn. *Cole's Solid Red*, H. & S., '86: Dwarf Red Solid, BRILL: Ivery's None-such, Vil.: London Market Red, Vil.: *London Red*, Greg., '86: New Large Purple, Burr: New Large Red, Burr: *Red Giant Solid*, Vil., '84: Tours Purple, Burr: Fr., Céleri pleine violet, Vil.: Céleri violet de Tours, VIL.: Span., Apio lleno rosado, Vil.

"The plant grows to a large size, full-hearted, with a thick stem. Leaf stalks thick, deeply furrowed, and very solid, of a dark red or purplish hue where exposed, rose-colored where partly blanched; but the perfectly blanched portion is pure white, more so than the blanched part of the white varieties. Crisp, of excellent flavor, and unquestionably the best variety of red celery." Burr.

C. Stems distinctly self-blanching.

No. 25. GOLDEN YELLOW, VEG. GAR.

Syn. *Eureka Self Blanching?*, Ev., '86, '87: *Golden Self Blanching*, Burpee, '86: *Yellow Golden Solid*, Vil., '84: Fr., Céleri Chemin, Vil.: *C. pleine blanc doré*, Vil., '84.

A variety of self-blanching celery of recent introduction, which originated with M. Chemin, near Paris, from the Sandringham celery.

Late in the season the foliage, which is quite dwarf and inclined to blister, assumes a yellowish color, and without banking, the inner stems blanch to a creamy white clear to the tips. Stems rather slender, tender, mild and crisp.

Readily distinguished from the White Plume by the yellowish tint of its stems and by its dwarfer, more yellowish foliage.

Correctly figured in Veg. Gar., p. 188.

No. 26. WHITE PLUME, HEN,; VEG. GAR.

Syn. *Henderson's White Plume*, Greg., '84; Hen., '84, '87: *Improved White Plume?*, Thor., '85.

The plant when young is little paler in color than in the Sandringham and other varieties of its class. But on the approach of autumn weather, the heart leaves become paler, and by the middle of October they have changed to a pure white; those about them take on a creamy white, spotted with pale green, and of the outermost leaves the ribs and veins are white. The stems are not numerous, but with the exception of the upper half of the outer row blanch completely without other banking than is sufficient to cause the stems to grow upright. When grown without banking, the stems are rather less mild and tender than in other varieties equally well blanched by banking. It is one of the earliest of all varieties, and the perfectly blanched central leaves are very attractive on the table. It does not, however, keep well as a winter celery.

Introduced in 1884 by Messrs. Henderson & Co., of New York. A bunch of plants is well illustrated in Gar. for Profit, ed. of 1887, p. 186.

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The figures refer to the number of the variety in the described list.

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London Red 24
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SPINACH.

The varieties of spinach are not numerous, and for the most part are not clearly defined. With the exception of the Prickly-Seeded, which some botanists have ranked as a distinct species, the chief differences between the varieties described in this article lie in their vigor, hardiness and time of running to seed. In the more improved varieties the leaves are thicker, more succulent and less distinctly hastate than in those less improved, but in all the leaves incline to hastate.

[Spinach appears to have been introduced into Europe through Spain by the Mauro-Spaniards. According to Beckman, the first notice of its use as an edible in Europe occurs in 1351 in a list of vegetables used by the monks on fast days, but in the Nabathean agriculture in Spain, in the twelfth century, Ibn-al-Awam speaks of it as a prince of vegetables. Albertus Magnus, who lived in Germany, and died in the year 1280, knew the prickly seeded form, and the Ortus Sanitatis, of 1511, figures the spinach and gives a Greek name, *aspenach*. It was also well known to Agricola in 1539. In England, the name *spynoches* occurs in a cook book of 1390 compiled under the

name of "The Forme of Cury" for the use of the court of King Richard the Second; in 1538 it is spoken of by Turner in his Libellus as well known in England, and in 1536 by Ruellius as if well known in France. These dates are interesting, as De Candolle calls it new to Europe in the sixteenth century, and other authors date its first mention in England as not preceding 1568. The smooth-seeded spinach is described by Tragus in 1552. According to Sprengel, spinach is noticed by Crescentius in the thirteenth century, and is badly figured in the Ortus Sanitatis, edition of 1491, c. 450. According to Bretschneider, it is noticed in a Chinese work on Husbandry, of the seventh or eighth century. I find no early notice of its introduction to America, but in 1806 three varieties were known to our gardens.—E. L. S.]

With the exception of the Prickly-Seeded, which is sufficiently distinct to form a separate class, the names in the following described list are arranged in alphabetical order.

DESCRIPTION OF THE VARIETIES.

A. Seeds not prickly.

(Spinacia glabra, Mill. Dict., S. oleracea, L. var. B.)

No. 1. BLOOMSDALE, Land., '85; Greg., '87.

Syn. *Bloomsdale Savoy*, H. & W.,'85: *Curled-Leaved Savoy or Bloomsdale*, Thor., '87.

A somewhat improved strain of the Savoy-Leaved, introduced several years ago by D. Landreth & Sons, of Philadelphia, and specially recommended by them for sowing in early autumn for early winter use, or in late autumn to produce plants for early spring use.

No. 2. FLANDERS, Vil.

Syn. *Broad Flanders*, Vil., '84: *Round Flanders*?, Thor., '85.

Closely resembles the Round Leaf, but the plant grows a little larger, the leaves are rather more rounded, and the seeds are perceptibly larger.

A hardy variety, recommended especially for fall sowing.

No. 3. LETTUCE LEAVED, Vil., '84; BURR; VEG. GAR.

Syn. Fr., *Épinard à feuille de laitue*, VIL., '84: É. d' Esquermes, Vil.: E. oreille d' elephant, Vil.; Burr: É. Gaudry, Vil.; Burr: Ger., Salatblättriger Spinat, Vil.: Lattichblättriger Sp., Vil.: Lattachblättriger sehr breiter Sp., A. de Cl.

Plant very deep green, compact, spreading; leaves large, on short petioles, rounded at the extremity.

Productive, of excellent quality, and slow in running to seed; good for spring sowing.

Correctly figured in Les pl. pot., p. 206.

No. 4. LONG STANDING, Sib., '83; Vil., '84; Thor., '85.

Syn. Late Seeding or Long Stander, VEG. GAR.: *New Long Standing*, Thor., '87: Fr., *Épinard lente à monter*, VIL., '84: Ger., Breit spät aufschiessender spinat, A. de Cl.

A strain of the Lettuce-Leaved spinach of recent introduction and running to seed later than any other sort. It forms low, compact tufts, with numerous deep green leaves, which are rather less rounded and more blistered than those of the Lettuce-Leaved; petioles very short.

The plant does not develop very rapidly in early spring, but its superiority is noticeable in the summer months, when it continues to produce tender leaves when other sorts have run to flower.

Correctly figured in Les pl. pot., p. 206.

No. 5. NORFOLK SAVOY-LEAVED, HEN.

Syn. *Henderson's Norfolk Savoy-Leaved*, Hen., '85, '87.

An improved strain of the Savoy-Leaved, being much more vigorous than the old variety, without losing any of its hardiness. It closely resembles Bloomsdale, but in our trials with spring sown seed it ran to seed considerably earlier than that sort.

Recommended only for fall sowing, for which purpose it is one of the best.

No. 26. ROUND LEAF, HEN.

Syn. *Extra Large Round-Leaved*, Greg., '84, '87: Round Dutch, Burr: *Round Leaved*, Thor., '87: Round Seeded Round-Leaved Large Dutch, VEG. GAR.: *Round or Summer*, Sib., '83: Summer or Round Leaved, BURR: Fr., Épinard de Hollande, (d) VIL.: É. rond, Vil.: Grand épinard, Vil.: Gros E., Vil.: Ger., Breitblättriger holländischer Spinat, Vil.: Port., Espinafre de semente redonda, Vil.

A hardy, large, vigorous variety, rather distinctly hastate, with leaves which are somewhat blistered, and clear green in color.

This variety is sufficiently hardy to endure the winter, and is grown both as a summer and a winter spinach.

The Lettuce-Leaved has frequently been sold for this variety.

No. 7. SAVOY-LEAVED, Sib., '83; VEG. GAR.

Syn. *American Savoy*, Thor., '85: *Savoy-Leaved Round Seed*, Vil., '84: Curled or Savoy-Leaved (d), Vil.; VEG. GAR.: Fr., Épinard à feuille cloquée, Veg Gar.: É. de Savoy, Vil.: Ger., Savoyer breitblättriger Spinat, Vil.

Plant vigorous, leaves numerous, thick and succulent, rather broad, rounded at the end, strongly blistered, somewhat rolled.

Succeeds best when sown in autumn. Sown in spring it runs to seed earlier than some other varieties.

No. 8. THICK-LEAVED, HEN., '85; H. & W., '85.

Syn. *New Thick-Leaved*, Hen., '87: *Thick-Leaved Round*, Sib., '83.

Closely resembles the Lettuce-Leaved, and may be identical with it; one of the most popular market sorts, producing large, thick, strong, somewhat blistered leaves. It is hardy, and equally well adapted for spring or fall.

No. 9. VIROFLAY, Sib., '83; Vil., '84.

Syn. *Large Round-Leaf Viroflay*, HEN., '87: *Large Round Viroflay*, Thor., '87: Viroflay Giant, VEG. GAR.: Fr., *Monstreux de Viroflay*, VIL., '84: Ger., Grösster rundblättriger Riesen-Spinat, Vil.: Viroflay sehr breitblättriger Spinat, A. de Cl.

Plant extremely vigorous, sometimes attaining a diameter of 20 to 24 in. In character of growth it resembles the Thick-Leaved and Flanders varieties, but far surpasses either in size. It attains its superior dimensions only under exceptionally high culture.

Correctly figured in Les pl. pot., p. 206.

B. Seeds prickly.

(Spinacia oleracea, L., var. a.)

No. 10. PRICKLY-SEEDED, Vil.

Syn. *Extra Large Prickly or Winter*, Vil., '84: Large Prickly Seeded, BURR: Large Winter, Burr: *Prickly or Winter*, Sib., '83: *Prickly*, HEN.; Thor., '85, '87: Fr., Épinard à longue feuille d'hiver, Vil.: É. d'Angleterre, VIL.: Ger., Englischer, breiter scharfsamiger Spinat, A. de Cl.: Langblättriger Winter spitzsamig S., Vil.: Port., Espinafre de semente picante, Vil.

The seeds of this variety are quite different from those of the other varieties here described, being armed with sharp spines, while in all the others they are roundish and smooth. The leaves are also more distinctly hastate than in most other varieties. When sown thinly, the plants form broad, spreading tufts, with numerous branches well furnished with leaves, and rather slow to flower.

This variety is chiefly grown as a winter spinach, and is very hardy. It is less grown at the present time than formerly, being largely superseded by the more productive varieties.

Correctly figured in Les pl. pot., p. 204.

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The figures refer to the number of the variety in the described list.

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Bloomsdale Savoy 1
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Breiter spät aufchiessender Spinat 4
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Curled or Savoy-Leaved 7
Curled Leaved Savoy or Bloomsdale 1
Englischer breiter scharfsamiger Spinat 10
Épinard à feuille cloquée 7
à feuille de laitue 3
à longue feuille d'hiver 10
lente à monter 4
d'Angleterre 10
d'Esquermus 3
de Hollande 6
de Savoy 7
Gaudry 3
monstreux de Viroflay 9
oreille d'elephant 3
rond 6
Éspinafre de semente pecanto 10
Espinafre de semente redonda 6
Extra Large Prickly or Winter 10
Extra Large Round Leaved 6
Flanders 2
Grand épinard 6
Gros épinard 6
Grösster rundblättriger Riesen-Spinat 9
Henderson's Norfolk Savoy Leaved 5
Landblättriger Winter Spitzsamig Spinat 10
Large Prickly Seeded 10
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Large Round Viroflay 9

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Late Seeding or Long Stander 4
Lattichblättriger Spinat 3
Lattichblättriger sehr breiter Spinat 3
Lettuce Leaved 3
Long Standing 4
New Long Standing 4
New Thick Leaved 8
Norfolk Savoy Leaved 5
Prickly 10
Prickly or Winter 10
Prickly Seeded 10
Round or Summer 6
Round Dutch 6
Round Flanders 2
Round Leaf 6
Round Leaved 6
Round Seeded Round-Leaved Large Dutch 6
Salatblättriger Spinat 3
Savoy Leaved 7
Savoy Leaved Round Seed 7
Savoyer breitblättriger Spinat 7
Summer or Round Leaved 6
Thick Leaved 8
Thick Leaved Round 8
Viroflay 9
Viroflay Giant 9
Viroflay sehr breitblättriger Spinat 9

CUCUMBERS.

Setting aside the Snake cucumber and the West India gherkin, which are distinct botanical species, the other varieties described in this article are readily separated into two classes by the color of the fruit in its younger stages of growth, which in some sorts is distinctly whitish, while in others it is green.

A. Young fruit, green. Nos. 1-18 incl.

B. Young fruit, white or greenish white. Nos. 19-24 incl.

Description of the Varieties.

A. Young fruit, green.

No. 1. BISMARCK, Greg., '84, '86, '87.

Said to be a cross between White Spine and Long Green. Closely resembles Tailby's Hybrid in its general character, but the fruit matures somewhat earlier, and is on the average of a rather less intense deep green.

No. 2. BROWN NETTED, Veg. Gar.; Vil.

Syn. Khiva, Veg. Gar.; Vil.: *Khiva Netted*, Ben., '86: *Netted Russian*, Vil., '84: *Russian Netted*, Greg., '83, '86, '87; Ben., '86; Vil., '87: *Russian Netted Cluster*, H. & S., '86: Fr., Concombre agourci de Russie, Vil.: *C. brodé de Khiva*, Ben., '86: C. brodé de Russie, VIL.: *C. brodé de Russie ou agourci*, Vil., '87: Ger., Braune genetzte Chiwa Trauben-Gurke, Vil.: Braune genetzte Walzen Trauben-G., Vil.: Braune genetzte Lucas'sche Trauben-G., Vil.: *Kurze Netz-Gurken aus Chiva*, Ben., '86: *Kurze russiche Netz-Gurken*, Ben., '86: Russische Netzgurke, A. de Cl.

Ripe fruit small, oval, dark russet brown; skin very tough and hard, covered with a rather fine whitish net-work of shallow cracks; well developed samples 4 or 5 in. long, about 3 in. in diameter; — at table size the fruit is very slightly warty, without prickles, rather distinctly furrowed, deep green at the stem, shading to nearly white at the blossom end; flesh greenish white, thin and seedy; — plant moderately vigorous, very productive, margin of leaves often entire; — season a little later than that of Early Russian.

Correctly figured in Les pl. pot., p. 160; Veg. Gar., p. 221.

No. 3. EARLY CLUSTER, Burr; Brill; Greg., '86, 87; Hen.; White.

Syn. *Boston Pickling* (incorrectly), Sib., '83: *Short Prolific Pickling*, Land., '85, 87.

Ripe fruit rather long oval, or short club-shaped; brownish yellow; considerably cracked; often with a few black prickles that rub off very easily; well developed samples 5 or 6 in. long, 2 to 2½ in. in diameter; — at table size dark green at the base, striped and speckled with paler or yellowish green; nearly round in section; little prickly; flesh thin and seedy; — at pickle size clothed with rather numerous black prickles; — plant moderately vigorous, very productive; — season early.

Recommended more for table use than for pickles.

Note. — In the true Early Cluster, the fruits are literally produced in clusters, three or more appearing at the same node; but judging from the samples tested, this quality seems to have been largely lost.

No. 4. EARLY FRAME, BURR; Greg., '86; Sib., '83; WHITE.

Syn. *Boston Pickling*, Greg., '86; VEG. GAR.; VIL.; Thor., '87: *Early Green Cluster*, Thor., '87 (not of Burr): *Early Short Green*, Thor., '83, '87: *Extra Early Green Prolific*, Hen.,'87 (a little earlier than the others): *Green Prolific Pickling*, Greg., '86, '87: Short Green, Burr.

Resembles the Early Russian, but the vine is rather more vigorous and the fruit nearly double the size, besides being usually several days later. Ripe fruit oblong oval, often swollen towards the blossom end; brownish yellow; skin much cracked; well developed samples about 6 in. long, $2\frac{1}{2}$ to 3 in. in diameter;—at table size quite warty, with very short black prickles that easily rub off; obscurely three-sided; furrowed; very deep green at the stem, shading to yellowish green at the blossom end; flesh greenish white, rather seedy, but tender;—plant moderately vigorous; foliage very deep dull green;—season early.

"Very productive, succeeds well, whether grown in open culture or under glass, and if plucked while small makes an excellent pickle." Burr.

No. 5. EARLY RUSSIAN, BURR; BRILL; Greg., '86; HEN.; Thor., '86, '87.

Syn. *Borowskian*, H. & S., '86: *Muromian*, H. & S., '86: *Russian Shortest Green*, Ben., '86: *Russian Small Earliest Pickling*, H. & S., '86: *Russian Small Early*, Vil., '84: *Small Early Russian*, Vil., '87: Early Russian Gherkin, VEG. GAR.: Extra Early Russian Gh., Vil.: Russian Gh., Vil.: Fr. Concombre à bouquet, Vil.: C. d'Italie, Vil.: C. de Pologne, Vil.: *C. de Russe*, VIL., '84, '87: C. Mignon, Vil.: *C. vert court de Russie très hâtif*, Ben., '86: Petit concombre, Vil: Ger., *Kurze russische grüne Treib-Gurke*, Ben.,'86: Russische kleine Trebi-G.,Vil.: Russisehe kurz Treib-G., A. de Cl.

Ripe fruit very irregular oval; smooth; brownish yellow; skin rather finely cracked; well developed samples 3 to 4 in. long, $2\frac{1}{2}$ in. in diameter;—at table size, dark green at the base, shading to white at the bottom end; obscurely three-sided; slightly furrowed; not warty but with numerous very small black spines; flesh greenish white, very thin, tender;—at pickle size, the fruit is slightly warty;—plant a feeble grower, running but 2 to 3 ft.; very productive, generally producing its fruit in pairs; foliage grayish green; leaves nearly entire, only the youngest ones distinctly lobed.

Generally conceded to be the earliest variety of cucumber now extant, maturing about ten days before the Early Cluster.

Correctly figured in Les pl. pot., p. 160; Veg. Gar., p. 221; Gar. for Profit (ed. 1887), p. 202.

No. 6. EXTRA LONG SMOOTH, Greg., '86.

Syn. *Extra Long Green Smooth*, Greg., '83, '87.

Ripe fruit more or less distinctly club-shaped, tapering slowly toward the stem, rounding at the blossom end, often somewhat crooked, with usually a very few black spines; nearly round in section; dull orange, inclining to brownish; well developed samples 12 in. long, $2\frac{1}{2}$ to 3 in. in diameter; — table size more cylindrical than club-shaped, but tapering abruptly to the stem, obscurely three-sided; very dark green near the stem, shading to paler at the blossom end, with a few scattering black spines; flesh greenish white, very thick, tender; — at pickle size, furrowed; densely covered with small black spines; — plant moderately vigorous and productive; foliage deep green; — season medium; or rather late.

No. 7. EXTRA LONG WHITE SPINED, Thor., '83, '87; VIL.

Syn. *Evergreen White Spine*, J. & S., '86: Long White Spine, VEG. GAR.

A strain of the White Spined bearing rather longer fruits, but scarcely differing from it in other respects; well developed samples, when ripe, 10 to 12 in. long.

No. 8. JERSEY PICKLE, Land., '85, '87.

This resembled the Early Cluster in its external characters, but the fruit was rather more cylindrical, and somewhat later in maturing. It is especially recommended for pickling, and is said to "green" better than any other.

No. 9. LANDRETH'S FIRST, Land., '85.

Syn. *Landreth's First Early*, Land., '87.

This appears to be a shorter form of the Long Green Turkey, though it seemed somewhat mixed with Long Green. In season quite early.

No. 10. LONG GRECIAN, Thor., '87.

Syn. Athenian, Veg. Gar.: *Athens*, Vil., '84: *Grecian*, Vil., '84: *Long Green Smooth from Athens*, Greg., '84, '86, '87: Fr., Concombre grec., Vil.: *C. long vert d'Athens*, VIL., '84: Ger., Griechische glatte Walzen-Gurke, Vil.: Griechische von Athens Gurke, A. de Cl.

Ripe fruit cylindrical, or approaching club-shaped; very smooth, sometimes slightly furrowed; rich yellow, inclining to brown in places; surface slightly cracked; well developed samples 12 in. long, 3 in. in largest diameter; — at table size, bright green at the base, shading to nearly white at the blossom end; surface irregular and furrowed,

but not warty, with numerous very small black spines; flesh white, thick, tender and crisp; — at pickle size long, slender, tapering, furrowed except near the stem, scarcely warty, but covered with small spines; — plant very vigorous, but not productive; leaves large.

Correctly figured in Les pl. pot., p. 164; Veg. Gar., p. 224.

No. 11. LONG GREEN, Greg., '86; Sib., '83; Thor., '87; Vil.

Syn. *Common Long Green*, VEG. GAR.; Vil., '84: *Long Green Turkey*, (incorrectly), Thor., '87: Fr., *Concombre vert long ordinaire*, VIL., '84.

Ripe fruit cylindrical, rounding at both ends, often swollen somewhat at the center, or toward the blossom end, often somewhat crooked; smooth; brownish yellow; well developed samples 10 to 12 in. long, $2\frac{1}{2}$ to 3 in. in diameter; — at table size long cylindrical, not furrowed, often almost round in section, smooth; very deep green, with some whitish green stripes at the blossom end, retaining its green color until almost full grown; nearly free from spines; flesh white, very thick, tender and crisp; — at pickle size, irregular cylindrical, dark green at the stem end, but pale, or whitish green in the greater part of its length; — plant vigorous and productive; — season medium.

A very popular variety both for table use and for pickles.

The IMPROVED LONG GREEN, Fer., '83; IMPROVED LONG GREEN PRICKLY, Greg., '86, '87; LONG GREEN SERPENT, Dam., '86, and GREEN ITALIAN SERPENT, Dam., '86, appeared very closely allied to this variety, many of the fruits of all appearing strictly identical, while others differed somewhat in length, form, or in the number of spines.

No. 12. LONG GREEN CHINESE, VEG. GAR.

Syn. *Green Long China*, Vil., '84: *Very Long Green China*, Vil., '85: Fr., *Concombre vert très long de Chine*, VIL., '84, '85: Ger., Lang Chinesische glatte Schlanger Gurke, A. de Cl.

Ripe fruit cylindrical or club-shaped, often slightly crooked, obscurely three-sided; smooth; yellowish white; well developed samples 12 in. long; — at table size, rather pale green, with whitish longtitudinal lines in the part toward the blossom end, and white spines that easily rub off; flesh very white, tender, thick; — plant vigorous, productive; — season medium.

Correctly figured in Les pl. pot., p. 165; Veg. Gar., p. 225.

No. 13. LONG GREEN TURKEY, BURR.

Syn. Extra Long Green Turkey, Burr: *Turkey Long Green*, Land., '85.

Differs from the Long Green in having the fruits more distinctly club-shaped, considerably longer, sometimes reaching a length of 18

in., without being larger in diameter; rather deeper green at table size, and having thicker and firmer flesh. The part toward the stem is quite seedless, being solid to the center; hence the variety produces few seeds, on which account it is often difficult to obtain it pure. The solid neck is not regarded an advantage by all, as this portion is often tough and bitter, rendering it undesirable for slicing. In season it is medium; in quality, good both for table use and pickles.

No. 14. MEAUX GREEN PICKLING, Vil., '87.

Syn. Fr., *Concombre à cornichons fin de Meaux*, Vil., '87.

Ripe fruit intermediate in size between Long Green and Nichol's Medium Green; club-shaped or cylindrical; often crooked; smooth; rich yellow, mottled with brown; skin more or less cracked; — at table size deep green at the base, slightly mottled with paler green, glaucous through the center, with some small warts, surmounted with blackish spines; blossom end pale green, with whitish stripes; flesh very thick, tender and crisp; — at pickle size rather pale green; tapering to a blunt point; warty, with numerous soft yellowish prickles; — plant moderately vigorous, leaves sharply lobed, the terminal lobe distinctly elongated; season medium.

Note. — An examination later in the season disclosed no perceptible differences between this and the Long Green.

No. 15. MONROE'S VERY LONG GREEN, Vil., '84.

Syn. Fr., *Concombre vèrt long de Monroe*, Vil., '84.

Ripe fruit club-shaped, often curved; pale yellow, more or less washed with russet; well developed samples 9 in. long, 3 in. in diameter; — at table size, warty and spiny; — plant very vigorous and productive,

This is probably one of the English "ridge" cucumbers.

No. 16. NICHOL'S MEDIUM GREEN, Hen., '86; Thor., '87.

Ripe fruit oblong oval, sometimes cylindrical or club-shaped' usually nearly round in section; yellow, orange, or brownish; skin somewhat cracked; well developed samples 5 to 8 in. long, $2\frac{1}{2}$ in. in diameter; — at table size intense green; nearly smooth, though sometimes distinctly furrowed; almost without prickles; flesh thick, remarkably tender; — at pickle size tapering, pale glaucous green; slightly warty, with rather numerous but short black prickles; — plant moderately vigorous, very productive; — season rather early.

Of recent introduction, very popular; recommended both for open and forced culture, for table use and pickles.

NOTE — Three cucumbers, viz., SHORT FRENCH PICKLING, Greg., '86, '87, SHORT PICKLING, Greg., '86, and SHORT GREEN, Greg., '86, so nearly resembled the above, as grown at the Station, that they could hardly be described as distinct, except a slight difference in the time of maturity. The last was considerably later than the other two, and these were somewhat less early than Nichol's Medium Green.

No. 17. TAILBY'S HYBRID, Greg., '83, '86; Rice, '83; Thor., '87.

Ripe fruit obscurely club-shaped, or cylindrical, usually more or less distinctly three-sided; white; usually retaining more or less of its spines; well developed samples 11 in. long, 4 in. in greatest diameter; — at table size very dark, almost blackish green, often very finely mottled with paler green, and obscurely striped toward the blossom end, with a few scattering and conspicuous white spines that easily rub off; flesh white, very thick, tender and crisp; — at pickle size deep green, furrowed, with numerous small warts, and short white spines; — plant very vigorous, with large deep green leaves, remarkably productive; — season late.

Said to be the result of a cross between the Early White Spine, and one of the largest English frame cucumbers. It is a very hardy and desirable variety.

No. 18. WHITE SPINED, BURR; WHITE.

Syn. Early White Spine, BRILL: Early White Spined, Burr: *Improved Early White Spined*, Thor., '87: *Improved White Spine*, HEN.; Sib., '83: *Improved White Spined*, Greg., '86: New York Market, Burr: *O. K. Perfect Pickling*. Ev., '85: *Peerless*, Thor., '84, '87: *Peerless White Spine*, Greg., '84, '85, '86: White Spined Long Green, WHITE.

Ripe fruit cylindrical, sometimes a little club-shaped, usually obscurely three-sided, regular; smooth; greenish white; well developed samples 9 in. long, $2\frac{1}{2}$ to 3 in. in diameter; — at table size deep green at the base, shading to paler, or yellowish green about the blossom end, where it is obscurely striped with yellowish green, somewhat glaucous; spines white, rather sparse, short, on small warty excrescences, easily rubbing off; flesh white, very tender, crisp, and of excellent flavor; — at pickle size, quite glaucous and warty in the outer half; — plant very vigorous and productive.

One of the most popular varieties, specially recommended for table use; it is said to retain its green color after picking better than other sorts.

B. Young fruit white, or greenish white.

No. 19. EARLY WHITE, VEG. GAR.

Syn. *White Early*, Vil., '84: Fr., *Concombre blanc hâtif*, VIL., '84: Ger., Weisse frühe Gurke, Vil.

Ripe fruit oblong-cylindrical; entirely smooth; somewhat triangular in section; almost pure white, with the slightest greenish tint; well developed samples 9 in. long, 3 in. in diameter; — at table size greenish white, with numerous very small white spines; — plant not a vigorous grower; — season rather early.

No. 20. EARLY YELLOW DUTCH, VEG. GAR.; Vil., '84, '87.

Syn. Fr., Concombre jaune hâtif de Hollande, VIL.: Ger., Gelbe Holländische sehr frühe Gurke, Vil.: Gelbe Holländische sehr frühe G., A. de Cl.: Holl., Lange gele Komkommer, Vil.

Ripe fruit oblong, oval or cylindrical, obscurely three-sided; often furrowed and somewhat crooked, with numerous very small black prickles; rich yellow, inclining to orange or brownish; well developed samples 8 to 10 in. long, 2½ to 3 in. in diameter; — at table size greenish white, rather slender, slightly furrowed, and a little warty; spines not at all conspicuous; flesh greenish white, very thick, tender and crisp; — at pickle size whitish green, tapering, smooth and a little swollen at the base, elsewhere furrowed and covered with short blackish spines; — plant vigorous, moderately productive; foliage rather light green; leaves distinctly lobed and serrated; — season rather early.

Correctly figured in Les pl. pot., p. 162; Veg. Gar., p. 222.

No. 21. LANDRETH'S WHITE SLICING, Land., '84, '87.

Ripe fruit oblong oval, smooth and regular; rich yellow, sometimes inclining to russet; skin very slightly cracked; well developed samples 8 in. long, 3 in. in diameter; — at table size rather irregular, furrowed and warty; nearly white, with a few blackish spines that easily rub off; flesh white, moderately thick, very crisp, tender; — at pickle size almost pure white, with numerous black spines; — plant vigorous and productive; leaves large, rather pale green; — season medium.

This variety seems intermediate between the white and russet cucumbers. It differs from the Early Yellow Dutch in being more russet at maturity, and in having blackish instead of white spines.

No. 22. LARGE WHITE BONNEUIL, Greg., '84, '85, '86, '87.

Syn. Bonneuil Large White, VEG. GAR.: Fr., Concombre blanc très gros de Bonneuil, VIL.: C. blanc gros, Vil.: Ger., Weisse sehr dicke von Bonneuil Gurke, A. de Cl.

Ripe fruit oval, or cylindrical, often much swollen at the center, and sometimes very irregular, obscurely three-sided, smooth; white; well developed samples 10 in. long, 4 in. in longest diameter; — at table size the fruit has numerous very short obscure spines that easily rub off; — at pickle size whitish green, with very numerous small warts, completely covered in the greater part of its length with white or transparent prickles; flesh very thick, often seedless in the half towards the stem, tender and crisp; — plant very vigorous, productive; leaves large, the older ones nearly entire; — season medium.

Correctly figured in Les pl. pot., p. 161; Veg. Gar., p. 222.

The cucumber most generally grown about Paris for the use of perfumers.

No. 23. WHITE GERMAN, Greg., '83, '85, '86, '87.

Ripe fruit long, rather slender cylindrical or club-shaped, nearly or quite round in section; very smooth; creamy or ivory white; well developed samples 12 to 15 in. long, 3 in. in diameter; — at table size greenish white, somewhat warty and spiny, obscurely furrowed; flesh white, very thick and tender; — at pickle size a shade more greenish; — plant vigorous and productive, with large, deep green leaves; — season medium.

No. 24. WHITE JAPAN, Greg., '85; Till., '85.

Syn. *Early White Japan*, Thor., '85, '87.

Ripe fruit oblong oval, rather regular, usually rounding rather abruptly to both ends, obscurely three-sided, somewhat furrowed; without spines; white, or faintly tinged yellow; well developed samples 8 in. long, 2½ to 3 in. in diameter; — at table size somewhat furrowed and warty; greenish white; flesh white, rather thin, tender; — at pickle size very pale green, tapering, with numerous white spines; — plant moderately vigorous; productive; leaves distinctly lobed; — season rather early.

No. 25. SNAKE CUCUMBER, VEG. GAR.; Vil., '84.—*Cucumis flexuosus* L. *Cucumis Melo* L. *var.*

Syn. Fr., Concombre de Turquie, Vil.: *C. serpent*, VIL., '84: Ger., Schlangen-Gurke, Vil.: Schlangen Melone, Vil.: Holl., Vlangen melone, Vil.: Ital., Anguria, Vil.: Cocomero torto, Vil.: Popone serpentino, Vil.

Ripe fruit very long and slender, usually with distinct longitudinal furrows, but not regularly ribbed, usually very crooked, thicker toward the blossom end than near the stem; sometimes slightly netted toward the blossom end; yellowish green; well developed samples 2

to 3 ft. long; flesh with a rather marked melon flavor; — plant not very vigorous; leaves rather pale grayish green, roundish cordate, not lobed, margin sharply toothed, surface not blistered; stem and petioles very hairy; flowers resembling those of the melon.

"The snake cucumber is a true melon. Sometimes the same stem bears slender, snake-like fruits, and others that are oval and inflated; sometimes even the same fruit is slender and more or less snake-like near the stem, but swollen at the extremity, assuming the appearance of a melon." Vil.

Correctly figured in Les pl. pot., p. 166; Veg. Gar., p. 226.

No. 26. WEST INDIA GHERKIN, Greg., '87; HEN.; Vil. *Cucumis Anguria L.*

Syn. *Burr Cucumber*, Greg., '87: Gherkin, WHITE: Prickly Gherkin, VEG. GAR.: Small Gh., Thor., '87: *Small West India Gh.*, Vil., '84: West Indian Gh., Veg. Gar.: Fr., Angurie, Vil., Concombre à épines, Vil.; C. d'Amerique, Vil.: C. cornichon des Antilles, Vil.: *C. des Antilles*, VIL., '84: C. marron Vil.: sometimes improperly called C. Arada, Vil.: Ger., West indische Gurke, Vil.

Ripe fruit regularly oval; covered with fleshy protuberances resembling spines; pale yellow; 1½ to 2½ in. long, 1¼ to 1½ in. in diameter; before maturity the fruit is pale green, with whitish, longitudinal stripes; flesh very thin, white, with an agreeable cucumber taste; — plant very vigorous, spreading; stem slender, covered with rough hairs; leaves resembling those of the water melon, divided into 5 to 7 roundish, toothed lobes; male flowers very small, borne on short, peduncles, female flowers on long slender peduncles.

This plant is not strictly a cucumber, but is usually classed as such. It is used for pickles.

Correctly figured in Les pl. pot., p. 167; Veg. Gar., p. 226.

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The figures refer to the number of the varieties in the described list.

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SQUASH AND PUMPKIN.

As used in this country, the names squash and pumpkin appear to have little, if any, reference to botanical distinctions in the cucurbits to which they are applied. In general terms, a cucurbit grown for table use is a squash, and one grown for stock is a pumpkin, but both words are sometimes applied to the same fruit by different observers. Evidently, then, no classification based upon botanical characters can separate the so-called pumpkins and squashes.

Botanists refer the numerous cultivated varieties of these cucurbits to three species, viz., Cucurbita maxima, Duch.; C. moschata, Duch, and C. Pepo, L. In this article, the varieties are first referred to their proper botanical species, after which they are classified with reference to the more conspicuous characters of the fruit. The descriptions of the species are taken from the contribution by Alfred Cogniaux to DeCandolle's Monograph of the Phanerogams, Vol. 3, pp. 544–546.

1. Cucurbita maxima, (Cogn.) Leaves harsh, with five rounded lobes, almost without sinuses between; hairs of the petioles stiff, but never pungent; peduncles terete; calyx tube of the male flowers ob-conical, never constricted beneath the insertion of the corolla, segments linear or thread-form; fruit-bearing peduncle thick, corky, striate, but never truly sulcate.

Stem sub-terete, trailing, elongated, [rarely quite short], leaves more or less reniform; corolla campanulate, intense yellow with reflex lobes; fruit-bearing peduncle cylindrical or club-shaped; fruit often very large, pulp scarcely fibrous, placentæ spongy, not readily deliquescent; seeds ovate, scarcely margined, white or yellow.

2. C. Pepo, (Cogn.) Leaves harsh, with five lobes which are acute and often lobulate; sinuses usually deep, acute or rounded; hairs of the petioles and of the nerves on the under side of the leaves rather stiff, often pungent; peduncles of the flowers obtusely pentagonal; calyx tube of the male flowers campanulate, constricted beneath the insertion of the corolla, the segments fleshy or corky; fruit-bearing peduncle often woody, polyhedral, sulcate, little expanded at its union with the fruit.

Stem long-creeping, or rarely short, angular, sulcate; leaves sometimes marbled with ashy white; calyx tube obscurely five-angled; corolla golden yellow; lobes reflexed or erect; fruit extremely variable, blackish green, golden yellow, yellow, or white or versicolor, ribbed or not ribbed, smooth or warty, small or large, often obovoid; pulp fibrous, placentæ readily deliquescent; seeds distinctly margined, broadly or narrowly ovate.

3. C. moschata, (Cogn.) Leaves soft, with five or six acute or rarely obtuse lobes, with acute sinuses between, [in our cultivated varieties more often not cut, but presenting more or less distinct angles]; hairs of the petioles and nerves never pungent; peduncles of male flowers sub-terete, or terete, of female ones pentagonal; calyx tube of male flowers short or wanting; segments flat, linear, apex usually dilated,

foliacious, or lobed; fruit-bearing peduncle often woody, polyhedral, sulcate, distinctly expanded at its union with the fruit.

Stem trailing, rarely abbreviated, sub-terete, or obscurely pentagonal, often black spotted at the nodes: leaves intensely green, frequently with white angular spots, roundish reniform, margin crenulate-denticulate; calyx intensely green; corolla, pale yellow; fruit usually cylindrical, blackish green or golden yellow; when mature often covered with a thin whitish bloom; pulp scarcely fibrous, placentæ readily deliquescent; seeds dirty white, distinctly margined.

CONSPECTUS OF THE SPECIES.

I. Plants annual.

A. Leaves harsh; calyx tube campanulate, with fleshy or corky segments.

1. Lobes of leaves rounded, scarcely any sinuses between, peduncles round. *C. maxima.*

2. Lobes of leaves acute, sinuses between them often deep, peduncles obtusely pentagonal. *C. Pepo.*

B. Leaves soft, calyx tube very short, or scarcely any, segments flat, usually dilated, foliaceous at apex. *C. moschata.*

From the above conspectus any variety may be referred to its proper species. But it is often desirable to refer a variety to its species from the fruit alone. This may be done quite readily with our cultivated varieties if the stem remains attached, by observing the following characters:

1. Fruit stem not grooved longitudinally. *C. maxima.*

2. Fruit stem distinctly grooved longitudinally.

*A. Stem little expanded at its union with the fruit. *C. Pepo.*

B. Stem strongly expanded at its union with the fruit. *C. moschata.*

A synopsis of the classification here adopted is as follows:

1. Fruit stem not grooved longitudinally.—*Cucurbita maxima.*

a. Fruits distinctly ringed† about the blossom end; the "turban" squashes, "giraumons" of the French. Nos. 1–5 incl.

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* In a few cases it may be difficult to decide whether the fruit stem is much or little expanded at its union with the fruit, as the expansion is about intermediate. In such cases, a glance at the male flowers will answer the question at once. If the calyx tube is constricted a little just beneath the insertion of the corolla, it is C. Pepo; but if the calyx lobes extend almost or quite to the peduncle, and are distinctly green in color, it is C. moschata.

† The word "ringed" is here used to express the peculiar formation at the blossom end of this class of squashes, whereby the fruit appears as if it were growing about a smaller sample of a different form.

b. Fruits not ringed.

* Fruits distinctly oblate. Nos. 6–11, incl.

† Fruits roundish, or more or less oblong. Nos. 12–22, incl.

2. Fruit stem distinctly grooved longitudinally.

A. Fruit stem little expanded at its union with the fruit. *C. Pepo.*

a. Fruits with conspicuous projections about the circumference.

* Fruits strongly flattened; pattypan shaped. Nos. 23–26, incl.

† Fruits more or less oblong. No. 27.

b. Fruits warty.

* Fruits club-shaped, the neck usually more or less crooked. Nos. 28–29.

† Fruits oval. Nos. 30–31.

c. Fruits roundish or oblate. Nos. 32–36, incl.

d. Fruits oval or cylindrical. Nos. 37–47, incl.

B. Fruit stem broadly expanded at its union with the fruit. *C. moschata.*

a. Fruits club-shaped or pyriform; the neck usually more or less crooked. Nos. 48–50, incl.

b. Fruit oblong. Nos. 51–52.

c. Fruits distinctly oblate. Nos. 53–55, incl.

DESCRIPTION OF THE VARIETIES.

NOTE.—In the following descriptions the variety is understood to be a squash, unless the word pumpkin is appended to the name.

1. Fruit stem not grooved longitudinally: — *Cucurbita maxima.*

This species furnishes the largest fruits, as well as those of the finest quality. The flesh is almost always free from fiber, and in many of the varieties very dry, sweet and well flavored. The plants are almost without exception running, and are generally very vigorous growers. They are, however, more subject to injury from insects than those of the other species.

a. Fruits distinctly ringed about the blossom end.

No. 1. AMERICAN TURBAN, Greg., '84, '86.

Syn. *Turban*, Greg., '85; Thor., '87: *Turk's Cap or Turban*, Vick, '87.

Fruit shaped like a bowl of which the sides are nearly perpendicular, the blossom end corresponding to the bottom; the greatest diame-

ter is often near the stem end, which is usually nearly flat, but sometimes very shortly cone-shaped; surface obscurely furrowed; skin moderately hard, deep orange, the rounded protuberances within the ring bluish white; well developed samples 10 in. in diameter, 6 in. through the axis; stem swollen near the fruit, but contracted at the union;—flesh orange, becoming very deep orange when cooked, very dry, fine grained, sweet and well flavored;—plant very vigorous; leaves deep green, undulate on the borders; petioles long, pale green, channeled, with numerous hairs; vine dark green.

The size of the ring, and the prominence of the protuberances at the blossom end vary much in different samples. In some both are almost wanting, while in others the ring is four or more inches in diameter, and the protuberances decidedly prominent.

A superior variety for autumn and winter use.

"Without doubt a combination of the Hubbard, Autumnal Marrow, Acorn and French Turban." Greg.

Correctly figured in "Squashes and How to Grow Them," Greg., p. 47.

No. 2. BAY STATE, Rawson, '87.

Fruit the form of the Essex Hybrid, the surface covered with blister-like protuberances, ribs obscure or invisible; skin pale leaden blue, mottled with whitish blue, hard and tough at maturity; well developed samples 10 in. in diameter, 8 in. through the axis; ring at blossom end distinct, narrow, the center sometimes bluish-white, and sometimes the color of the rest;—stem swollen near its union with the fruit;—flesh bright goldenyellow, fine grained, dry, sweet and well flavored;— plant rather vigorous, productive; leaves clear green, obscurely angled, smooth, dishing, border often coarsely undulate.

In season about the same as Essex Hybrid or perhaps slightly earlier; recommended as an excellent keeper.

Introduced in 1887 by W. W. Rawson & Co., Boston, Mass., and fairly well illustrated in their catalogue of that year.

No. 3. ESSEX HYBRID, Fer., '83; Sib., '83; Vick, '87.

Syn. *Low's Premium Hybrid*, Thor., '82, '85, '87.

Very similar in form and in the character of the plant to the American Turban, differing from it in being a shade darker in color, and in having a hard shell like the Hubbard;—flesh yellow, dry, sweet and of excellent flavor. It is a very productive winter squash and is especially recommended for long keeping.

Said to be a cross between the American Turban and Hubbard.

No. 4. RED CHINA, Thor,, '87.

Syn. *Red Cardinal*, Dam., '86: *Small China Turban*, Vil., '84: Small Chinese Turban Gourd, VEG. GAR.: Fr., *Giraumon petit de Chine*, Vil., '84: Ger., Genfer plattrunder Kürbiss, A. de Cl.: Chinese, Hong-nan-kona, Vil.

Fruit strongly flattened, depressed about the stem; ribs rather obscure, terminating at the ring, which is usually small; at the center of the ring is a small knob of the same color as the border; skin very hard and tough, rich orange red, with a few yellow or green longitudinal stripes; the depressed portion within the ring is sometimes green, and sometimes richly variegated with alternate irregular stripes of red, yellow and deep green. The whole fruit is sometimes somewhat warty; — flesh thin, pale yellow, dry and rather sweet; stem slender; — plant moderately vigorous; leaves rather small, pale green, entire; petioles short, usually slender, pale green, sometimes striped with whitish green; channeled, with numerous white hairs; vine slender, pale green.

Correctly figured in Les pl. pot., p. 177; Veg. Gar., p. 258.

No. 5. TREE PUMPKIN, Greg., '85, '86, '87.

Fruit rather small; oblate, or very short cylindrical, somewhat hollowed about the stem; ribs obscure, the ring rough and whitish, the center usually regular, dull, pale bluish green; the main part blackish green; well developed samples 7 in. in diameter, 5 in. through the axis; — flesh greenish yellow, dry, but rather inferior in flavor; — plant vigorous, scarcely running, often quite bushy in habit; leaves clear green, roundish cordate; petioles pale green, distinctly channeled, hairs very numerous; vine thick, deep green, angular.

The only variety of C. maxima grown at the Station in which the vine is not distinctly running.

The fruit is said be good for pies.

½. Fruits not ringed about the blossom end.

***Fruits distinctly oblate.**

No. 6. BOULOGNE GRAY PUMPKIN, VEG. GAR.

Syn. *Gray Boulogne Pumpkin*, Till., '85; Fr., *Potiron gris de Boulogne*, VIL., '87.

Fruit very strongly oblate, hollowed about the stem, and at the blossom end, obscurely ribbed; skin rather soft, dark green, finely shaded and mottled with pale yellowish green; surface finely marked with short whitish corky lines; well developed samples 12 in. in

diameter, 8 in. through the axis, described as sometimes attaining a diameter of 30 in.; — flesh thick, sweet and rather dry; — plant very vigorous; moderately productive; leaves entire, large, deep green; petioles often long and slender, channeled, the channels darker than the ridges, with numerous short, stiff hairs; vine dark green at the base. The fruit is said to keep well.

Of comparatively recent introduction, and much esteemed by the market gardeners about Paris. It is excellent for pies, though hardly equal to the Etampes pumpkin for this purpose.

Correctly figured in Les pl. pot., p. 173; Veg. Gar., p. 254.

No. 7. ETAMPES PUMPKIN, VEG. GAR.

Syn. *Bright Red Etampes Pumpkin*, Thor., '84: Vil, '87: *Mammoth Red Etampes* P., Greg., '86, '87: Fr., *Potiron rouge vif d'Étampes*, VIL., '87.

Fruit very large; often irregular, hollowed about the stem, sometimes also at the blossom end, at the center of which is often a small ring, with a short cylindrical protuberance at the center; ribs broad, usually rather obscure, but sometimes prominent; skin nearly smooth, rich salmon color, with occasional paler stripes, soft; well developed samples 15 in. in diameter, 9 in. through the axis; — flesh yellow, remarkably thick, fine-grained and sweet; — plant very vigorous; leaves large, smooth, clear green; petioles pale, sometimes whitish green, often striped with two shades of green, distinctly channeled, with numerous short hairs; vine large, nearly round at the base.

A superior variety for pies. The fruit keeps well.

Correctly figured in Les pl. pot., p. 172; Veg. Gar, p. 253.

No, 8. MAMMOTH, BURR; Bliss, '83.

Syn. *Jumbo Pumpkin*, Hen., '87: Large Yellow Gourd, Burr; Vil.: *Large Yellow Mammoth Pumpkin*, Vil., '87: *Mammoth Chili*, HEN.; Thor., '85, '87: Mammoth Pumpkin, Burr; VEG. GAR.; Vil.: Fr., Potiron jaune, Burr: P. jaune gros, VIL.: P. romain, Vil.: Ger., Allergrösste Riesen Centner-Kürbiss, Vil.: Holl., Groote gele reuzen meloen-pomeon, Vil.

Fruit very large; usually strongly oblate, but sometimes roundish, hollowed about the stem and at the blossom end; ribs more or less distinct; skin soft, pale salmon yellow, more or less cracked and netted at maturity; well developed samples 18 in. in diameter, 12 in. through the axis; — flesh yellow, thick, fine-grained, and sweet; — plant remarkably vigorous, sometimes running 40 feet or more; leaves very large, obscurely five-lobed or entire, clear or rather pale green, strongly dishing; petioles sometimes two feet or more long, pale green, channeled, the furrows darker than the ridges, with numerous

rather stiff hairs; vine deep green towards the base, obscurely angular.

Considered the largest variety extant, specimens having exceeded 200 pounds in weight. The vines are not productive so far as the number of fruits is concerned, and they require a long season for complete development. The fruit is said to keep well, and to be of excellent quality. It is superior for pies.

No. 9. NEW MEDITERRANEAN, J. & S., '86.

Syn. Chestnut (d), VEG. GAR.: Fr., Courge châtaign, Vil.: C. marron, VIL.: C. pain des pauvres, Vil.: Potiron de Corfou, Vil.: Ger., Braunrother Kastanien Kürbiss, A. de Cl.

Fruit medium or rather small; ribs nearly or quite wanting; rich salmon color, sometimes inclining to scarlet; well developed samples 7 in. in diameter, 6 in. through the axis; stem large, short and fleshy, swollen near the center, pale green striped with white; — plant very vigorous; leaves entire, with undulate borders, apex very often retuse, dull grayish green, sometimes strongly washed with gray, rather strongly dishing; petioles slender, tall, channeled, striped more or less distinctly with light and dark green, with numerous short, white hairs; vine angular.

The plant is rather productive, and the fruit is said to keep well.

Correctly figured in Les pl. pot., p. 174; Veg. Gar., p. 255.

No. 10. POSSUM NOSE PUMPKIN, Greg., '86.

Fruit slightly oblate, hollowed about the stem, and terminating in a small cylindrical protuberance at the blossom end; ribs obscure, surface smooth, slightly warty; pale salmon color, with whitish stripes; well developed samples 9 in. in diameter, six in. through the axis; — flesh thick, rich orange; stem swollen at the center; — plant vigorous; leaves very large, deep green; petioles pale green, sometimes striped with two shades, distinctly channeled with numerous short, rather stiff hairs; vine rather slender, pale green, nearly round at the base.

Said to keep well, to be fair for table use, and excellent for pies.

No. 11. SPANISH GOURD OR PUMPKIN, VEG. GAR.

Syn. *Green Spanish Pumpkin*, Vil., '87: Spanish Gourd, Vil.: Fr., *Potiron vert d' Espagne*, VIL., '87.

Fruit medium or large; strongly oblate, distinctly hollowed about the stem and blossom end; irregularly ribbed; skin soft, dull green, mottled and netted with whitish green; well developed samples 18 in. in diameter, 12 in. through the axis; — flesh thick, very bright

yellow; — plant very vigorous, moderately productive; leaves clear green, often very large, margin sinuate, surface smooth, somewhat dishing; petioles obscurely channeled, distinctly striped with two shades of green, with very short hairs; vine almost round.

Excellent for pies.

Correctly figured in Veg. Gar., p. 254.

† Fruits roundish, or more or less oblong.

No. 12. BOSTON MARROW, BRILL; Burr; Greg., '84; HEN., '85; Sib., '83.

Syn. Autumnal Marrow, BURR; Greg. (not of Vil.): Marrow, Greg.

Fruit short pyriform, sometimes approaching roundish, with a more or less distinct point at the blossom end, often terminating in a small nipple, or wart-like excrescence; ribs very obscure; skin very thin, covered with fine indentures, giving it a pock-marked appearance, orange, mottled with light cream color, rather pale when first ripe, becoming darker; well developed samples 8 in. in diameter, 10 in. through the axis; — flesh thick, salmon-color, deep orange when cooked, very sweet, dry, and well flavored; stem usually short and thick, contracted a little at its union with the fruit, and tapering slightly toward the vine, often 2 in. in largest diameter; — plant very vigorous, running 20 ft. or more; leaves large, roundish, the margin nearly or quite entire, borne on long, tapering, distinctly channeled, hairy petioles, of which the furrows are deeper green than the ridges; vine rather large, angular, deep bluish green toward the base; much branched. "Seeds large, thick, pure white." Burr.

An autumn variety that comes into use in August, and may readily be kept until Christmas or after.

Introduced about 1832 by Mr. John M. Ives, of Salem, Mass., and supposed by him to have come originally from the West Indies.—Burr.

Correctly figured in Ferry's catalogue of 1884 and subsequent years.

No. 13. BUTMAN, GREG., '84, '86; Hen., '85; Sib., '83; Thor., '87.

In form and size closely resembling the Hubbard, but without the blister-like elevations; ribs obscure, point distinct, but short, often curved; skin pale dull green, with whitish stripes and splashes; — flesh light salmon color, thick, very dry, sweet and especially well flavored; — plant vigorous; leaves large, obscurely angular; petioles striped with pale and whitish green, hairs short, rather numer-

ous; vine blackish green at the nodes, much branched, obscurely angular.

One of the finest winter squashes. "In its prime from October to January, though as a keeper it is equal to the Hubbard." Greg.

Correctly figured in Squashes and How to Grow Them, p. 71.

No. 14. DUNLAP'S EARLY MARROW, Greg., '87.

The fruit bears a striking resemblance to that of Boston Marrow, but averages rather larger and shorter, and is 10 to 12 days earlier in maturity; well developed samples 10 in. in diameter in both directions; the smaller fruits longer in proportion to their diameter; — flesh rich yellow, of excellent quality. The plant is very productive, and its fruit is said to keep well.

No. 15. EXTRA EARLY ORANGE MARROW, Thor., '87.

Closely resembles the Boston Marrow, but the fruit is distinctly deeper in color, and a little longer in proportion to its diameter. In quality it resembles the Boston Marrow, but it is several days earlier in maturity. The plant is very productive.

No. 16. HUBBARD, BRILL; BURR; GREG., '86; HEN.; Land., '84; Sib., '83; Thor., '87; VEG. GAR.; Vil.

Syn. *Improved Hubbard*, Maule, '86: Fr., Courge vert de Hubbard, VIL.: Ger., Dunkelgrüner Hubbard Kürbiss, A. de Cl.

Fruit "spherical at the middle, gradually receding to a neck at the stem end, and to a point, usually curved at the calyx end, where it terminates in a kind of button" (Greg.); ribs rather obscure, sometimes wanting; surface overspread with numerous blister like protuberances; skin very hard and tough, dull, dark green, orange where it rests on the earth, usually with streaks of dirty white toward the blossom end, upper surface brownish when long exposed to the sun; well developed samples 10 in. long, 8 in. in longest diameter; stem irregularly striped while nearing maturity with dirty white, and two or more shades of green; — flesh very thick, rich salmon yellow, remarkably fine grained, dry, rich, and well flavored; — plant vigorous; leaves often very large, margin sinuate, finely serrate, border usually rather distinctly undulate, limb often strongly dishing; petioles long, often thicker than the stem, distinctly channeled toward the base, hairs numerous, white; vine very large, rather pale green, darker toward the base, angular, with numerous white hairs.

The standard winter squash for family use and market. It is hardly surpassed in quality, an excellent keeper, and when unripe, is superior

for table use to most summer squashes. The plant is very productive, but is more subject to injury from the squash vine borer than many others. The fruit, however, is said to be less injured by frost than the Boston Marrow or American Turban.

The origin of the Hubbard is not known. According to Mr. Gregory, it was brought into Marblehead, Mass., about the year 1807, by a marketman named Green, who resided near Boston. It may have come from the West Indies.

The illustration given in "Squashes, and How to Grow Them," Greg., p. 44, is more nearly correct as to form than the one in Les pl. pot., p. 175; Veg. Gar., p. 256; but the latter shows the outer markings rather better.

No. 17. IMPROVED MAMMOTH PUMPKIN, Thor., '87.

This seemed allied to the Mammoth Squash. Fruit roundish or slightly oblong, often rather irregular, distinctly depressed about the stem, inclining to pointed at the blossom end; ribs rather distinct in some samples, almost invisible in others; skin moderately hard, mottled with salmon and rather pale yellow, with stripes of dirty white following the furrows from the blossom end about half way to the stem, which is very short and thick, and constricted at its union with the fruit; well developed samples 16 in. in diameter, 20 in. through the axis;—flesh yellow, thin for the size of the fruit, fine-grained and sweet.

The vine and foliage are scarcely different from those of the Mammoth Squash.

Excellent for pies, but rather less rich than the Etampes Pumpkin.

No. 18. LONG WHITE ITALIAN MUSHROOM, Dam., '86.

Fruit very large, oval with rather distinct ribs; white, sometimes inclining to pink, very smooth, but not glossy; well developed samples 18 in. long by 10 in. in diameter; stem short; — plant very vigorous; leaves rather pale green, slightly grayish, entire, usually bluntly pointed at apex, border plain; petioles often thicker than the vine, channeled, with numerous short, white hairs; vine slender, pale green, nearly round, rather densely clothed with white hairs.

No. 19. MARBLEHEAD, Greg., '86; Hen., '85; Maule, '86; Sib., '83.

Syn. *New Marblehead*, Thor., '85, '87.

Fruit oval, inclining to pointed at both ends; ribs very obscure; skin very dull light blue, extremely hard at maturity; well developed

samples 11 in. long, 7 in. in diameter; — flesh yellow, remarkably dry, sweet and well flavored; — plant vigorous; leaves large, roundish-reniform, obscurely angled, margin finely serrate; petioles pale green, sometimes channeled towards the base, with numerous short, stiff whitish hairs; vine pale green, angular, sometimes slightly furrowed.

The plant is productive, and the fruit is said to keep rather better than that of the Hubbard.

Introduced several years ago by Mr. J. J. H. Gregory, of Marblehead, Mass.

Correctly figured in "Squashes, and How to Grow Them," p. 70.

No. 20. OHIO, Thor., '87; Greg., ?'82; Vil.

Syn. Autumnal Marrow, Vil., (not of Greg.): California Marrow, Vil.: Fr., Courge de l' Ohio, VIL.: Ger., Ohio langlichrunder gelber Kürbiss, A. de Cl.

Fruit oval, sometimes thickest near the stem, and sometimes at the center or near the blossom end; distinctly but not prominently ribbed; terminating in a slight nipple; skin moderately hard, salmon pink with a small green patch about the nipple; well developed samples 9 in. in diameter, 11 in. through the axis; — flesh rather thick, tender, fine-grained, dry, very well flavored; — plant vigorous; foliage clear green; leaves roundish, or obscurely angled, margin entire or sinuate, apex rounded, surface very smooth; petioles rather slender, channeled, with numerous very short hairs; vine large, deep green.

The cut of this squash given by Vilmorin, Les pl. pot., p. 175, is an exact representation of one form of it. As grown at the station, the fruit was as often regularly oval, or thickest toward the blossom end.

No. 21. OLIVE, VEG. GAR.; Vil., '84.

Syn. *New French Olive*, Thor., '87: *New Olive*, Thor., '85: Fr., *Courge olive*, VIL., '84: Ger., Oliven langlichrunder Kurbiss, A. de Cl.

Fruit oval, inclining to pointed at the blossom end, but rounding to the stem; skin hard, very smooth, very deep green, finely mottled and shaded with yellowish green; well developed samples 12 in. long, 6 in. in diameter; — flesh yellow, rather thick, very dry, sweet and well flavored; — plant very vigorous; leaves large, entire, obscurely angled, clear green, surface very smooth but dishing, border coarsely undulate, apex distinctly pointed; petioles nearly uniform pale green, channeled, with rather numerous short, stiff, white hairs; vine very slender, pale green, little furrowed, obscurely angular.

Of recent introduction, but one of the finest winter squashes. The

plant is not very productive, but the fruit keeps well, and is scarcely excelled in quality.

Correctly figured in VEG. GAR., p. 257.

No. 22. VALPARAISO, BURR; VEG GAR.; Vil., '84.

Syn. Commodore Porter, Burr: Porter's Valparaiso, Burr: Fr., *Courge de Valparaiso*, VIL., '84: Ger., Valparaiso grosser Kürbiss, A. de Cl.

Fruit large, oval, scarcely ribbed, often terminating in a wart-like excrescence at the blossom end; surface usually more or less netted, creamy white, often with a tinge of gray; well developed samples 18 in. long, 13 in. in diameter; — flesh rather thin, rich yellow or orange, generally of good quality; — plant vigorous; leaves large, toothed on the margin, pale green, often with a peculiar grayish metallic appearance; "seeds rather large, Nankeen yellow, smooth and glossy." Burr. The fruit keeps fairly well.

Correctly figured in Les. pl. pot., p. 174; Veg Gar., p. 255.

2. Fruit stem distinctly grooved longitudinally.

A. Fruit stem little expanded at its union with the fruit: — *Cucurbita Pepo.*

a. Fruits with conspicuous projections about the circumference.

***Fruits strongly flattened, "patty-pan" shaped.**

No. 23. PATTYPAN, Greg.; Vil.

Syn. Crown Gourd, Vil.: Custard G., Vil.: Custard Marrow G. (Am.), Veg. Gar.; Vil.: Cymbling, Burr: Elector's Cap, Veg Gar.: Early Bush Scallop, WHITE: Early Scalloped Bush, BRILL: Scollop Gourd, Veg. Gar.; Vil.: Fr., Arboufle d'Astrakhan, Vil.: Arbouste d'Astrakhan, Vil.: Artichaut d'Espagne, Vil.: A. de Jerusalem, Vil.: Bonnet d'Electeur, Vil.: B. de prêtre, Vil.: Couronne impériale, Vil.: Patissons, VIL.: Ger., Bischofsmutze, Vil.: Flam., Prinsenmuts, Vil.

A very distinct and peculiar form of *Cucurbita pepo*, of which several varieties or sub-varieties are cultivated, which may in the main be described together.

The form of the fruit is well suggested by the name; strongly flattened, the contour presenting five or ten rounded excrescences or teeth which incline either outward, forward, or back. The fruit is usually distinctly convex at the blossom end, and inclining to flat on the other, but sometimes the reverse is true, and at others both ends are convex; flesh rather thick, but not sweet nor very dry; skin very smooth, hard and tough at maturity; seeds small, broad in proportion to their

length; stem long, slender, tapering, blackish green; — plant not running, or running but feebly; leaves large, clear green, more or less distinctly 3 or 5 lobed; petioles numerous, nearly uniform pale green, the larger ones distinctly channeled, hairs rather sparse; vine dark green, very short.

The fruits form very early, and are used while the skin may be readily pierced by the finger nail.

A plant with the fruit is correctly figured in Les. pl. pot., p. 185; Veg. Gar., p. 265.

"In the month of June large quantities are shipped from the Southern and Middle States, where they anticipate from two to three weeks the products of the home market gardeners." Burr.

No. 24. VARIEGATED PATTYPAN.

Syn. *Striped Custard Marrow*, VEG. GAR.; Vil., '85: Variegated Bush Scalloped, BURR: Fr., *Pattisson panaché*, Vil., '85.

Fruit hemispherical, nearly flat, or depressed at the stem end, projections not very prominent; creamy white, irregularly striped, with two shades of green; well developed samples about 7 in. in diameter, 4 in. through the axis; plant feebly running, runners 4 to 6 ft. long.

Very handsome, but of inferior quality. — Burr.

The cut of Patisson panaché amélioré, Les pl. pot., p. 185, Veg. Gar., p. 266, represents the above equally well, almost the only difference in the two being in size.

No. 25. WHITE PATTYPAN, Burr.

Syn. *Early Bush*, Greg., '84: *Early White Bush Scallop*, BURR; Sib., '83; Thor., '87: White Summer Scalloped, Burr: Fr., Patisson blanc, Burr (credited to Vil.).

Skin of a rather dull white color. The fruit when full grown measures 6 to 8 in. in diameter.

No. 26. YELLOW PATTYPAN.

Syn. *Custard Marrow*, Bliss, '83: *Early Golden Bush*, Thor., '87: *Early Yellow Bush Scallop*, BURR: *Golden Bush*, Greg., '84: Pattypan, Burr: Yellow Custard Marrow, VEG. GAR.: *Yellow Elector's Cap*, Vil., '85: Yellow Summer Scallop, Burr: Fr., *Patisson jaune*, Vil., '85.

Skin of uniform butter color; fruit of the size of that of the White Pattypan. By some the flesh is thought to be a little finer grained and better flavored than that of the White Pattypan.

Considered by M. Vilmorin to be the original type of the cultivated pattypan.

Correctly figured in Les pl. pot., p. 185; Veg. Gar., p. 265.

† Fruits more or less oblong.

No. 27. PINEAPPLE, Thor., '87.

Syn. *Landreth's White Turban*, Land., '84, '85, '87: *New Pineapple*, Thor., '85: *New White Pineapple*, B. M. & Co., '84.

Fruit somewhat resembling that of the White Pattypan, but decidedly longer through the axis in proportion to its diameter. The projections are disposed in 5 distinct pairs. As in the White Pattypan, these sometimes incline outward and sometimes toward the blossom end; and as in the latter the stem end of the fruit is sometimes nearly flat, and at others convex or even conical, usually with a more or less distinct narrow cavity about the stem; skin white or creamy white; well developed samples 8 in. in diameter in both directions; stem slender, little tapering or furrowed, finely and irregularly striped with light and dark green, with numerous long and very slender hairs; — flesh pale yellow, of rather good quality; — plant running, vigorous; leaves large, pale green, usually distinctly 5-lobed; petioles rather slender, often very long, little furrowed, pale green, hairs few, slender, transparent; vine very thick, deeply furrowed, almost without hairs.

The plant is very productive; the fruit is used both in its young and mature state, and is an excellent keeper.

Correctly figured in Ferry's catalogue. 1887.

b. Fruits warty.

* Fruits club-shaped, the neck usually more or less crooked.

No. 28. BUSH SUMMER CROOKNECK, HEN.

Syn. Bush Gourd, VEG. GAR.: Bush Summer Warted Crookneck, BURR: Crookneck Gourd, Veg. Gar.: Early Bush, Vil.: Early Crookneck Bush, BRILL: Early Summer Crookneck, Burr: *Summer Crookneck*, Greg., '84, '86; Thor., '87; Vil.; WHITE: *Summer Golden Crookneck*, Sib., '83: Fr., Courge coutors hâtive, VIL.: C. coutors hâtive non coureuse, A. de Cl.: C. crochue, Vil.: Ger., Früher Crookneck Kürbiss, A. de Cl.

Fruit short club-shaped, but more or less crooked toward the stem, usually terminating in a point at the blossom end; clear bright yellow; well developed samples 8 in. long, 3 in. in longest diameter; skin very hard and tough when fully mature; flesh greenish yellow, watery but well flavored; "seeds comparatively small, broad in proportion to the length, pale yellow" (Burr); — plant not running, but forming a tuft about 2½ ft. high, and 4 or 5 ft. in diameter; leaves large, clear green, little dishing, more or less distinctly 3 or 5 lobed, margin serrate;

petioles rather pale green, distinctly channeled; hairs not numerous, but rather large and stiff, translucent; vine deep green, furrowed.

One of the earliest varieties; good for use while the skin is sufficiently tender to be easily pierced by the finger nail. The fruit is sometimes dried, and used as an ornamental gourd.

Correctly figured in Les pl. pot., p. 184; Veg. Gar., p. 264.

A running variety of Summer Warted Crookneck is extant, but it has not been grown at the Station.

No. 29. LONG GREEN CROOKNECK, Land., '85.

Syn. *Long Green Summer Crookneck*, Land., '87.

Fruit club-shaped, neck usually more or less crooked; skin hard and tough, blackish green, often beautifully variegated with irregular and narrow stripes of pale or yellowish green, yellow where lying on the soil; well developed samples 14 in. long, 3½ in. in longest diameter; — flesh pale yellow, moderately dry, sweet and well flavored; stem slender, slightly tapering, deep green; — plant running vigorous; leaves large, deep green, distinctly 3 or 5 lobed; petioles pale green, rather obscurely channeled, with a few short, stiff hairs; vine very dark green toward the base, shallow, furrowed, with a few white prickles.

† Fruits oval.

No. 30. BRAZILIAN SUGAR, Thor., 87; Vil., '84, '85.

Syn. Brazilian Sugar Gourd, VEG. GAR.: Fr., *Courge sucrière du Brésil*, VIL., '84, '85: Ger., Brazilianischer Zucker-Kürbiss, Vil.

Fruit oval; ribs obscure; skin very hard and tough, dark green before maturity, orange when fully ripe; well developed samples 5 in. diameter, 6 in. through the axis; stem pale green, rather slender, tapering, with numerous long and slender, whitish hairs; — flesh yellow, thick, very sweet; — plant vigorous; leaves deep green, much blistered, margin rather remotely dentate; petioles uniform pale green, scarcely channeled, with a few rather strong green hairs; vine pale green, deeply furrowed, with numerous slender green hairs.

The fruit is recommended as being of good quality, and keeping well, and the plant is quite productive.

Correctly figured in Les pl. pot., p. 182; Veg. Gar., p. 263.

No. 31. NANTUCKET PUMPKIN, BURR.

Syn. Hard-Shell Pumpkin, Burr: Nigger Head P., Burr: *Negro* P., Greg., '85, '87.

Fruit roundish, sometimes oblate, or oblong; ribs obscure; skin

extremely hard, very deep glossy green, faintly mottled with paler green, the excrescences marbled with yellowish green; well developed samples 8 in. in diameter, 7 in. through the axis; — "flesh comparatively thick, yellow, sweet, fine grained and of excellent flavor" (Burr); stem sometimes paler than the fruit, short, thick, slightly expanded at its union; — plant very vigorous, productive; leaves clear green, deeply 5-lobed, the terminal lobes somewhat cut, margin deeply toothed near the petioles, which are pale green, scarcely channeled, with numerous stiff hairs; vine blackish green at the base and for a considerable distance.

The fruit keeps well, and the skin changes to yellow or orange after being stored a long time.

c. Fruits roundish or oblate.

No. 32. COCOANUT, Greg., '86; Hen., '85 (not the Cocoanut of BURR).

Syn. Little Cocoanut, Rice, '83; Thor., '82, '85, '87.

Fruit small, nearly round, hollowed about the stem, ribs numerous, distinct; creamy white, shading to rich yellow or orange in the furrows, toward the blossom end the colors change abruptly to deep, often almost blackish green; — flesh fine-grained and of excellent quality; stem very slender, very deep green, scarcely tapering; — plant running, very vigorous, much branched at the base; leaves rather distinctly 3-lobed; petioles slender, of uniform color, with few hairs; vine deep bluish green, becoming pale green farther out, furrowed, nearly destitute of hairs.

The plant is very productive; the fruit matures rather late, and keeps fairly well.

Correctly figured in Gregory's catalogue of 1882 and succeeding years.

No. 33. GENEVA BUSH, Vil., '85.

Syn. Geneva Bush Gourd, Veg. Gar.: Fr., *Courgeron de Genève*, VIL., '85.

Fruit distinctly oblate, sometimes much flattened, somewhat depressed about the stem and at the blossom end, the furrows obscure or invisible; deep green when immature, rich yellow or orange when ripe; well developed samples 6 in. in diameter, 4 in. through the axis; — flesh pale yellow, quite thin; stem pale green, tapering, hairy; — plant not running; leaves rather light green, three or five lobed; petioles pale green with deeper green stripes; vine about 2 ft. long, obscurely angular, deep green, rough, but scarcely spiny.

A summer squash of which the fruits are used before fully grown; when ripe, the skin is rather hard and tough.

Correctly figured in Veg. Gar., p. 264.

No. 34. LARGE FIELD PUMPKIN, Greg., '87.

Syn. Common Yellow Field Pumpkin (d), Burr: *Golden Marrow* P.?, Till., '85: *Michigan Mammoth* P.?, Greg., '87.

Fruit roundish, or slightly oblong, inclining to short cylindrical, depressed a little at each end; ribs numerous but not prominent; skin moderately hard, rich orange; well developed samples 15 in. in diameter, 12 to 14 in. through the axis; — flesh yellow, one to two inches thick; stem tapering, scarcely hairy; — plant very vigorous; leaves deep green, often somewhat marbled with white; distinctly 3 to 5 lobed, the terminal lobe often rather deeply cut; petioles pale green, channeled, with short stiff hairs; vine slender, deep green at the base, nearly without hairs.

Very commonly grown in the fields of Indian corn as food for stock in New England and the Middle States; and used to a considerable extent for pies. It is, however, inferior for the latter purpose to some of the larger varieties of *C. maxima*, as the flesh is more stringy, less highly flavored, and cooks less quickly. The quality varies much, and the samples having a deep orange skin, mottled with darker specks, are richest and sweetest. Before the introduction of the improved varieties of table squash, the flesh of this pumpkin was often boiled and served as a vegetable, and Mr. Burr states that during the war of the revolution it was the custom to reduce by evaporation the liquid in which the flesh of pumpkins had been cooked, as a sweetening to be used as a substitute for molasses.

No. 35. PERFECT GEM, Greg., '84; Sib., 83; Thor., '82, '84, '87.

Fruit small; oblate, depressed about the stem; ribs numerous and distinct; skin smooth, hard, creamy white; well developed samples 5 in. in diameter, 4 in. through the axis; — flesh pale yellow, dry, moderately sweet and well flavored; stem long and slender; — plant running, very vigorous; leaves very numerous, rather distinctly 3-lobed, intense deep, almost glossy green, borders finely undulate; petioles rather slender, obscurely channeled, faintly striped with two shades of green, with a few stiff white hairs; vine much branched, with numerous shallow furrows.

The plant is very productive and at first grows somewhat like a bush squash, but later numerous runners start out. The fruit begins to form

late in the season, but develops quickly, and is used both green and ripe. It keeps nearly equal to the Hubbard.

The branches of the vine often grow fasciated, forming broad, flat runners, with the petioles crowded very closely, and with multitudes of female flowers.

Correctly figured in Gregory's catalogue of 1887 and previous years.

No. 36. SUGAR PUMPKIN, BURR.

Syn. *Early Sugar Pumpkin, Thor.*, '87: Small Sugar P., Burr: *Sweet P.*, Sib., '83.

Fruit roundish or oblate, depressed more or less at the ends, with numerous rather obscure ribs; skin rather hard, bright orange; well developed samples 8 in. in diameter, 6 in. through the axis; — flesh pale yellow, rather thick, sweet and fine grained; stem blackish green, somewhat tapering; — plant moderately vigorous; leaves deep green, sometimes spotted with ash-color, deeply 3 to 5 lobed, the terminal lobe more or less cut, apexes of lobes pointed; petioles obscurely channeled, often striped with two shades of green, darker towards base, with short, stiff hairs; vine blackish green at the base.

b. Fruit oval or cylindrical.

No. 37. BLACK NEGRO PUMPKIN, Thor., '87.

Fruit oval; ribs very prominent, swollen about the stem; very dark; dull bluish green, orange where in contact with the ground; well developed samples 7 in. in diameter, 10 in. through the axis; skin very hard; — flesh rich yellow, not very thick; stem large, deep green, penciled with whitish green; — plant very vigorous; leaves deep green, strongly dishing, with numerous and rather large whitish spots, deeply 5-lobed, the lobes somewhat cut and terminating in a small, elongated point; petioles pale green, darker at the base, scarcely channeled, with short, white, stiff hairs; vine large blackish green.

No. 38. CITRON BUSH, Dam., '86.

Syn. *Mandarin Bush*, Dam., '86: *New Egg-Plant*, Hen., 87.

Fruit very large; obovate or oval, rather oblong, sometimes obscurely pointed at the blossom end; ribs very obscure except about the stem; skin very hard and tough, dull yellow when fully mature; well developed samples 20 in. long, 10 in. in longest diameter; stem remarkably short, thick, rapidly tapering, deep green; — plant not running, but very vigorous, sometimes attaining a height of 3 ft.; leaves very large, sometimes 18 to 20 in. across, deeply 5-lobed, the

terminal lobe distinctly notched, usually more or less dishing, deep green, on some plants strongly marked along the veins with angular, ash-colored spots, borders plain, margin rather coarsely and deeply serrate; petioles very numerous, almost concealing the vine, long, sometimes an inch and a half in diameter, but often quite slender, pale green, scarcely channeled, with a few short, stiff hairs; vine usually not more than one and a half feet long, much branched, some of the branches growing nearly upright, dark green toward the base.

No. 39. GREEN STRIPED BERGEN, BURR; GREG.; Thor., '82, '85, '87.

Syn. *Green Striped Bush*, Hen., '83, '85: *Marrow Striped Cluster*, H. & S., '87.

Fruit small, inversely bell-shaped, sometimes ovate, depressed about the stem; ribs numerous, distinct about the stem; disappearing toward the blossom end; the furrows very dark green, the ridges creamy white, with irregular spots and patches of pale and dark green; well developed samples 5 in. in diameter, 6 in. through the axis;— flesh pale yellow, rather dry, moderately sweet, not very well flavored; stem slender, very dark green, tapering, scarcely furrowed, little hairy;— plant not running, growing to a diameter of 4 or 5 ft.; leaves often very large, clear green, distinctly 3, sometimes 5-lobed, the lobes and apex rounded at the terminus; petioles rather slender, pale green, distinctly channeled, with a few rather conspicuous whitish or translucent hairs; vine pale green, angular or furrowed; male flowers on slender peduncles.

No. 40. ITALIAN VEGETABLE MARROW, BURR; VEG. GAR.; VIL.

Syn. *Italian Green Striped*, Vil., '84: Fr., Coucourzelle, Vil.: Courge Coucourzelle, Burr: *C. d'Italie*, VIL., '84: Ger., Langer Italienischer Kürbiss, A. de Cl.

Fruit cylindrical, rounding, and sometimes swollen at the blossom end, tapering to the stem, where the five rather obscure ribs are most prominent; skin very smooth, quite hard, blackish green, with irregular yellowish stripes and spots; well developed samples 18 in. long, 4 in. in diameter;— plant not running; foliage dense and compact; leaves very dark green, deeply cut, with dentate lobes; petioles pale green; vine scarcely exceeding a foot in length.

"In Italy, where this squash is very generally cultivated, the fruits are always used young, or about the size of a small cucumber; sometimes even before the flower has opened, and when the ovary is scarcely the size and length of the finger. The plants thus deprived of their young fruits continue to yield profusely for several months. Gathered

at so early a stage, the fruits are said to be extremely tender and delicate." Vil.

Correctly figured in Les pl. pot., p. 182; Veg. Gar., p. 262.

No. 41. LARGE TOURS PUMPKIN, Vil., '87.

Syn. *Large Tours or Mammoth*, Hen., '87: Fr., *Citrouille de Touraine*, VIL., '87: Ger., Tours Centner-Kürbiss, A. de Cl.

Fruit very large, oblong oval or roundish, usually somewhat irregular and more or less flattened at the ends; ribs numerous, but rather obscure; skin rather soft, smooth, pale, slightly grayish green, striped and marbled with deeper shades; well developed samples 18 in. in diameter, 2 ft. through the axis; — flesh yellow, not very thick, and rather inferior in quality; plant vigorous; leaves deep green, sometimes very slightly washed with white, very large, lobes often sinuate, and sometimes cut in the younger leaves, surface inclining to blister, often wrinkled along the midrib; petioles pale green, obscurely channeled, with rather sparse, short stiff hairs; vine deep green toward the base.

"Generally cultivated only for feeding cattle." Vil.

Correctly figured in Les pl. pot., p. 184.

No. 42. LONG WHITE BUSH MARROW, VEG. GAR.; Vil.

Syn. *Long White Marrow Bush*, J. & S., '86: Short Jointed Long White gourd or squash, Vil.: Fr., Courge blanche non coureuse, VIL.: C. de Virginie, Vil.: Ger., Langer Weisser Ohne Ranken Kürbiss, A. de Cl.: Weisse Kürbiss ohne Ranken, Vil.

Fruit long, comparatively slender, slightly swollen toward the blossom end, with five very narrow ribs, which are more prominent toward the stem; skin very smooth, white at full maturity; well developed samples 20 in. long, 4 in. in longest diameter; stem very short, very pale green, deeply furrowed, rapidly tapering; — plant not running, about 4 ft. in diameter, 2 ft. high; leaves deep green, with some grayish spots, very deeply 3 to 5 lobed, the lobes sometimes rather deeply cut, margin coarsely serrate, limb usually strongly dishing; petioles numerous, very pale green, scarcely channeled, with a very few short, stiff hairs; vine pale green, very short.

A summer squash, of which the fruits are used before maturity.

Correctly figured in Les pl. pot., p. 181; Veg. Gar., p. 262.

No. 43. MAMMOTH PUMPKIN, Sib., '87.

Fruit oblong oval, approaching cylindrical, the ends inclining to flat; obscurely ribbed, deep green, very finely mottled with whitish specks, very pale yellow where in contact with the soil; well developed

samples 12 in. in diameter, 15 in. through the axis; skin rather soft; — flesh nearly white, thin, not firm, apparently very poor in quality; — plant vigorous; leaves very deep green, much spotted with grayish white, smooth; petioles rather short, channeled, the channels often blistered; sparsely hairy.

As grown at the Station, this variety appeared to have no value. It is possible, however, that the fruit failed to fully mature.

No. 44. ORANGE BUSH, Dam., '86.

The plant scarcely differs from that of Citron Bush, but the fruit is nearly round, with a broad depression at the blossom end; ribs marked about the stem, but obscure over the rest of the surface; skin rather rough, rich yellow, splashed with green; well developed samples 12 in. in diameter in both directions; stem short, furrowed, tapering rapidly, deep green.

No. 45. PATAGONIAN, BURR; VEG. GAR.; Vil., '84.

Syn. Fr., *Courge de Patagons*, Vil., '84: Ger., Patagonier schwarzgüner Kürbiss, A. de Cl.

Fruit oblong oval, with five very prominent, narrow, rounded ribs; skin deep, almost blackish green, not changing at maturity; well developed samples 15 in. long, 8 in. in diameter; — flesh pale yellow, inferior in quality; stem rather pale green, deeply furrowed, slightly tapering, set in a shallow cavity; — plant running, very vigorous; leaves large, 3 or 5 lobed, clear green, with dentate margins; petioles long, rather slender, pale green, smooth, with rather numerous, green, stiff hairs; vine deep green toward the base, pale toward the extremities.

"Remarkable for its hardiness and productiveness."

Correctly figured in Les pl. pot., p. 183; Veg. Gar., p. 263.

No. 46. VEGETABLE MARROW, BURR (Credited to Thompson); GREG.; HEN.; Sib., '83; Thor., '87; VEG. GAR.; Vil., '85.

Syn. *Marrow Long White*, H. & S., '86: Succade Gourd, Burr: Fr., *Courge à la moelle*, VIL., '85: Moelle vegetale, Vil.: Suki blanc des Indes, Vil.: Ger., Englischer Schmeer-Kürbiss, Vil.: Flam., Mergpompoen, Vil.: Dan., Mandel-Groeskar, Vil.

Fruit oval or cylindrical, the five or ten more or less distinct ribs most marked toward the stem; skin very hard and tough at maturity; dull yellow or creamy white; well developed samples 12 in. long, 5 or 6 in. in diameter, often larger; — flesh white, tender and well flavored, particularly while the fruit is immature; stem deeply furrowed, taper-

ing, deep green; — plant running, very vigorous; leaves medium, deeply 3, sometimes distinctly 5-lobed, clear green, often with ash-colored spots at the junction of the larger veins, limb rather strongly dishing, margin distinctly serrate, lobes sinuate on the margin, apex bluntly pointed, surmounted by a sharp projection; petioles slender, distinctly furrowed, very deep green toward the base, paler toward the extremity.

Very popular in England, where the fruits are used at all stages of growth after the blossom falls. The ripe fruit keeps well throughout the winter.

Correctly figured in Les pl. pot., p. 181; Veg. Gar., p. 261.

No. 47. WHITE PORTMANTEAU, Dam., '86.

Fruit very large; cylindrical, slightly swollen towards the blossom end; ribs very obscure; skin white, very smooth; well developed samples 26 in. long, 8 in. in diameter; stem rather slender, furrowed dark green; — plant running, vigorous; leaves often very large, roundish cordate, deep green, conspicuously marked with angular ash-colored spots at the junction of the veins, obscurely 3-lobed, apex and lobes bluntly pointed, margin very finely dentate or serrate; petioles rather slender, scarcely channeled, but often distinctly striped longitudinally with dark and pale green, hairs short, very numerous; vine rather slender angular, very deep green toward the base, with hairs like the petioles; flowers large on rather slender angular peduncles, calyx tube obscurely angular, sometimes extremely short, pale green, lobes very large, green, hairy, nearly erect, distinctly furrowed above.

B. Fruit stem broadly expanded at its union with the fruit. — *Cucurbita moschata.*

a. Fruits club-shaped or pyriform, the neck usually more or less crooked.

No. 48. CANADA CROOKNECK, GREG.; Thor., '83, '85, '87; VEG. GAR.; Vil.

Syn. Fall or Winter, gourd or squash, Vil.: Winter Gourd, Veg. Gar.: Fr., Courge coutors du Canada, VIL.: Ger., Canadischer Crook-neck Kürbiss, A. de Cl.

Fruit club-shaped, quite thick toward the blossom end, with a long, rather slender, solid neck, which is usually more or less curved; skin rather soft, yellow at full maturity, but dark green, often partly covered with a whitish bloom-like appearance before ripeness; well developed samples 10 to 12 in. long, 5 or 6 in. in largest diameter; —

flesh orange, thick, sweet, and when at its best, dry and well flavored, but often coarse and stringy; stem slender, tapering, much swollen at its union with the fruit, very deep green; — plant moderately vigorous; leaves very deep green, rather small, entire; petioles rather slender, tapering, obscurely channeled, the furrows often deeper green; vine more slender than the petioles, deep bluish green, with numerous white hairs.

A winter squash of good average quality, and an excellent keeper. It is said that in a few instances the fruit has kept into the second year after growing.

Correctly figured in Les pl. pot., p. 179; Veg. Gar., p. 260.

No. 49. CASHAW PUMPKIN, Thor., '87.

Fruit very thick club-shaped, sometimes inclined to curve, with a slight basin about the blossom end; obscurely ribbed; skin rather hard, dull pale yellow, finely mottled with a still paler tint; well developed samples 12 in. long, 7 in. in greatest diameter; — flesh pale yellow, solid except in the more swollen part near the blossom end; — plant moderately vigorous; leaves rather pale, dull green, with numerous whitish spots, large, obscurely 5-angled, surface smooth, considerably dishing, margin finely and distinctly serrate; petioles scarcely channeled, but striped with two shades of green, the older ones rather less hairy than the vine, which is nearly or quite round, pale green, striped in places with deeper green, densely covered with short white hairs.

Another Cashaw Pumpkin, Land., '85, '87, bore fruit much the form of the Winter Crookneck squash, but larger in size, with numerous narrow, but not prominent ribs; skin rather soft, light cream color when ripe, pale green, with a whitish bloom when immature; — flesh salmon colored. The characters of the plant very closely resembled those of the above, with the exception that the vine was more vigorous. This is evidently the one described by Burr, who also mentions a third variety of which the fruit "is nearly round."

Both of the Cashaw pumpkins grown at the Station were very late, and would probably mature only in the most favorable seasons.

No. 50. WINTER CROOKNECK, Burr.

Syn. Cuckaw, Burr: *Large Winter Crookneck*, Greg., '87.

Fruit rather thick club-shaped, the neck usually curved, green or cream color when mature, though the color often changes after harvesting. "If green when plucked, it gradually becomes paler, or if yellow, it becomes a reddish cream color." Burr. Well developed

samples 18 or 20 in. long, 6 in. in longest diameter; — "flesh salmon yellow, not uniform in texture or solidity, sometimes close-grained, sweet and fine flavored, and sometimes coarse, stringy and nearly worthless for the table." Burr. Plant vigorous; leaves deep green, often with whitish angular spots, rather distinctly angled, sometimes obscurely lobed; petioles channeled, the furrows darker green, less hairy than the vine, which is slender and very deep green.

A very hardy and productive variety. The fruit keeps remarkably well.

Correctly figured in Field and Garden Vegetables of America, p. 226.

b. Fruits oblong.

No. 51. EARLY NEAPOLITAN, Veg. Gar.; Vil., '84.

Syn. "*Early*," Dam., '86: Early Carpet-Bag Gourd, VEG. GAR.: Fr. *Courge portmanteau hâtive*, VIL., '84: Ger., Früher Mantelsack-Kürbiss, Vil.: Neapolitanischer Mantelsack-K., A. de Cl.

Fruit oblong, swollen toward the blossom end; obscurely ribbed; dull yellow when fully ripe; well developed samples 16 in. long, 5 in. in longest diameter; — flesh thick, solid and seedless except in the center of the swollen part, rich yellow, sweet and of excellent quality; — plant running, moderately vigorous; — leaves roundish cordate, inclining to pointed at apex, sometimes obscurely 3-lobed, deep, rather dull green, with veins and spots of whitish gray; petioles not much channeled, but rather distinctly striped with pale and deep green, with rather numerous short, stiff, white hairs; vine rather slender, very deep green, not furrowed, but obscurely angular, with very numerous long, slender white hairs.

The illustration of Courge pleine de Naples, Les pl. pot., p. 178; Veg. Gar., p. 259, would answer equally well for this variety, which is but an earlier form of it, differing only in size and season.

No. 42. ORANGE COLOR GIANT MELON, Dam., '86.

Fruit large; oval, ribs very obscure; rich orange; well developed samples 16 in. long, 10 in. in diameter; stem rather long, fleshy, not swollen at the center, pale green or yellowish, variegated and striped; — plant running, extremely vigorous; leaves very large, roundish cordate, usually with a short, slender, protruding point, dull, slightly grayish green; petioles rather slender, channeled, with numerous short, white, hair-like prickles; vine much branched at the base, section nearly round.

NOTE.— The fruit of this variety appeared considerably mixed.

c. Fruits distinctly oblate.

No. 53. LARGE CHEESE PUMPKIN, Hen., '86.

Probably the Cheese pumpkin of Burr.

Fruit strongly oblate, with prominent ribs; skin smooth, moderately hard, yellow when ripe, before maturity mottled green, and covered with whitish bloom; well developed samples 10 to 12 in. in diameter, 5 to 6 in. through the axis; stem slender, hairy; — plant vigorous; leaves large, entire or obscurely 3-lobed, deep green, with angular ash-colored spots; petioles pale green, scarcely channeled, with numerous short, stiff hairs; vine slender, angular, with the prickles more numerous and longer than on the petioles.

In a Large Cheese pumpkin from Thor., '87, the fruit was globular, or short pyriform, and of a pale, dull yellow, or buff color; but the characters of the plant correspond with the above.

No. 54. NIGGER PUMPKIN, Sib., '86.

Fruit strongly oblate, with numerous, but not prominent ribs; rich orange; well developed samples 9 in. in diameter, 5 in. through the axis; blossom end depressed into a broad but shallow basin; stem deep green, little hairy, set in a broad, shallow, furrowed cavity; — plant vigorous, moderately prolific; leaves pale green, nearly entire; petioles pale green, little channeled, with a very few short hairs; vine deep green at the base, angular or slightly furrowed, nearly destitute of hairs.

No. 55. YOKOHAMA, GREG., '83; Vil., '87.

Syn. Yokohama Gourd, VEG. GAR.: Fr., *Courge de Yokohama*, Vil., '87; Ger., Japanesischer oder Yokohama Kürbiss, A. de Cl.

Fruit strongly oblate, with a basin about the stem and at the blossom end, quite irregular in form; distinctly and prominently ribbed and covered with small blister-like protuberances; skin hard, blackish green, the ends changing to light brown at complete maturity; well developed samples 10 in. in diameter, 5 in. through the axis; stem paler than either the fruit or vine, tapering; — flesh very thick, lemon color, fine grained and excellent; — plant vigorous, moderately productive; leaves very deep dull green, much spotted with white, entire, cordate, bluntly pointed at apex, younger leaves obscurely angled; petioles short, scarcely channeled, but sometimes striped with two shades of green, with rather numerous, short hairs; vine blackish green, furrowed. The fruit keeps well,

"After storing, it soon becomes entirely of a copper-like color,

and is covered with a slight bloom. * * * The heaviest of all squashes in proportion to its size."

"Introduced into this country from Japan in the year 1860 by Mr. James Hogg." Greg.

Correctly figured in Les pl. pot., p. 180; Veg. Gar., p. 260.

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EGG-PLANT.

The varieties are few in number, and generally clearly defined. They are very readily separated into four classes by the color of the ripe fruits. The two scarlet varieties described are distinct from the others in having white flowers, as well as in the form of the fruits. They are also quite distinct from each other, each of them having been described as a separate botanical species.

Two of the classes may be sub-divided with reference to the form of the fruits.

The classification adopted is as follows:

1. Fruit purple.
   - A. Fruits roundish, or ovoid. Nos. 1–4, incl.
   - B. Fruits distinctly oblong. Nos. 5–7, incl.
2. Fruits (ripe) distinctly striped with purple and greenish yellow. No. 8.
3. Fruits white or cream colored.
   - A. Fruits roundish or ovoid. No. 9.
   - B. Fruits distinctly oblong. No. 10.
4. Fruits scarlet. Nos. 11–12.

DESCRIPTION OF THE VARIETIES.

1. Fruits purple.

A. Fruits roundish, or ovoid.

No. 1. BLACK PEKIN, BRILL; HEN., '83; Thor., '86; VEG. GAR.; Vil.

Syn. Fr., Aubergine noire de Pekin, Vil.: A. rond de Chine, VIL.: Ger., schwarze Pekin Eier-frucht, A. de Cl.

Fruit nearly spherical, glossy blackish purple, skin green where covered by the calyx lobes; well developed samples 6 in. in diameter;—plant 2 to 2½ ft. high; foliage rather dark purple, leaves large, nearly flat, margin coarsely but irregularly and roundly notched, borders nearly plain, leaves downy below; the younger ones purple on the

under side; stem blackish, mottled with grayish specks; calyx blackish purple, very rough and somewhat spiny, the pointed divisions irregular in number.

A very popular variety. The fruit matures rather earlier than that of the New York Improved, and is considered superior to it in flavor. The plants are also more productive.

Correctly figured in Album de Clichés, Vil., No. 47,043.

No. 2. EARLY DWARF PURPLE, Veg. Gar.

Syn. *Early Round Violet*, Dam., '86: *Extra Early Dwarf Purple*, Thor., '83, '86: *Very Early Dwarf Purple*, Greg., '84, '85, '86: Fr., Aubergine violette naine très hâtive, VIL.: Ger., Violette sehr frühe Zwerg-Eierfrucht, A. de Cl.

Fruit small, obovate, dull, very dark purple, pale green where covered by the calyx; well developed samples 4 in. long, 2½ in. in diameter; flowers deep purple, peduncle swollen toward the fruit, and with the calyx on ripe fruit, has a slightly shriveled appearance; — plant low and branching; leaves slightly grayish green, elongated, thickly dotted on both sides with minute purplish specks, veins and petioles blackish purple, the latter sometimes slightly spiny.

The earliest variety extant, maturing its fruits three or four weeks before any other. The plants are remarkably productive, sometimes yielding a dozen fruits each, and their very dwarf habit makes them particularly adapted to frame culture.

Correctly figured in Les pl. pot., p. 26; Veg. Gar., p. 232.

No. 3. NEW YORK IMPROVED, Burr; Hen.; Veg. Gar.; Vil.

Syn. *Ferry's Improved Large Purple*, Fer., '83: *Monstrous of New York*, Dam., '86: New York Improved Large Purple, Brill: *New York Improved Purple*, Hen., '85; H. & W., '85: *New York Improved Round Purple*, Greg., 86: *New York Purple*, Thor., '86; Veg. Gar.: Fr., Aubergine de New York, Seg. Gar.: A. monstreuse de New York, A. de Cl.: A. violette de New York, Vil.: Ger., Violette sehr grosse Amerikanische Eierfrucht, A. de Cl.

Resembles in general character the Round Purple, but the plant is more dwarf, of a more grayish green, and the fruit a shade paler in color. Fruit roundish, usually with a slight basin at the end opposite the stem, glossy purple, well developed samples about 6 in. in diameter in both directions; flesh nearly solid, the seed cavity very small; calyx pale green, scarcely spiny, irregularly cleft; — plant 12 to 15 in. high, compact, stocky, rather spreading, usually producing about 2 fruits; leaves numerous and large, nearly concealing the stem and fruit, flat, distinctly lobed, the younger ones with undulate borders; stem stocky, and with the petioles, ribs and veins very

downy, destitute of spines, sometimes slightly inclining towards purple; — season intermediate.

The most popular variety in the New York market. Produced through selection from the Round Purple by Francis Brill, formerly of Jersey City, N. J.

Correctly figured in Album de Clichés, Vil., No. 47,041.

No. 4. ROUND PURPLE, Burr; Sib., '83; Thor., '86; Veg. Gar.

Syn. Fr., Aubergine violette ronde, VIL.

Fruit obovate, or short pyriform, slightly indented at the end opposite the stem; deep purple, sometimes a little streaked with yellowish green; well developed samples 5 in. in diameter, 6 in. through the axis; calyx and peduncle pale green, with rather numerous prickles; — plant dwarf, rather spreading, 12 to 18 in. high, and of equal diameter; leaves less large and less numerous than in the New York Improved; stem and branches glossy, much washed with purple towards their terminii; petioles, ribs and veins more or less tinged with purple; ribs of larger leaves often spiny, especially below; leaves nearly entire, the younger ones with undulate borders.

The plant is moderately productive, and medium or rather late in season.

Correctly figured in Les pl. pot., p, 25; Veg. Gar., p. 232.

B. Fruits distinctly oblong.

No. 5. LONG BLACK PURPLE PALERMO, Ben., '86.

Syn. *Long Dark Violet of Palermo*, Dam., '86; Ger., *Lange schwarzviolette von Palermo Eierpflanze*, Ben., '86.

Fruit large, long, obovate, rich brownish purple, slightly streaked and spotted in places with pale green; well developed samples 8 in. long, 4 in. in longest diameter; calyx pale green, deeply cleft, with two principal lobes, spiny; peduncle very large, striate, wrinkled; — plant vigorous, stocky, with immense nearly entire leaves; stem large, considerably branched, and with the petioles, ribs and veins faintly washed with purple; larger leaves nearly or quite a foot long, and 9 in. wide, midribs spiny both above and below; — season intermediate.

The fruit of this variety bears a considerable resemblance to that of the Long Purple, but the aspect of the plants is quite different.

No. 6. EARLY LONG PURPLE, Greg., '86; Hen., '85; Veg. Gar.; Vil.

Syn. Fr., Aubergine violette longue hâtive, VIL.

Fruit long obovate, sometimes a little club-shaped, usually somewhat curved, glossy, blackish purple; well developed samples 8 in.

long, 2½ in. in diameter; calyx green, usually formed of two principal segments, rough, wrinkled and with the peduncle somewhat spiny; — plant about 2 ft. high, branches rather few and spreading; leaves rather small, not numerous, giving the plant an open appearance that well exposes the fruit; petioles, ribs and veins sometimes purplish, downy but not spiny; the youngest leaves strongly washed with purple; stem blackish purple, with a very few inconspicuous spines, speckled with grayish toward the terminii of the branches.

An early and productive variety of good quality.

No. 7. LONG PURPLE, BURR; HEN.; Sib., '83; Thor., '86; VEG. GAR.; Vil.; WHITE.

Syn. Fr., Aubergine de Narbonne, Vil.: A. Violette longue, VIL.: Ger., Lange blaue Eierpflanze, Vil.: Lange violette Eierfrucht, A. de Cl.

Fruit oblong oval, somewhat club-shaped, very smooth, glossy, blackish purple, sometimes striped with green or yellow; well developed samples 7 in. long, 2½ in. in diameter; calyx brown, spiny; — plant about 2 ft. tall, green throughout except the very youngest leaves, which are often bordered with purple; leaves rather small, sinuate-lobed; stem glossy, little downy except toward the terminii of the branches, and with the petioles, ribs and veins pale green, sometimes inclining to brown; spines few.

Early, productive, hardy and reliable.

Correctly figured in Les pl. pot., p. 24; Veg. Gar., p. 231.

2. Fruits distinctly striped with purple and greenish yellow.

No. 8. STRIPED, VEG. GAR.; Vil.

Syn. Guadaloupe, Veg. Gar.: Guadeloupe, Vil.: *Guadeloupe Striped*, Bliss, '83; BURR: Striped Gaudeloupe, WHITE: *Striped Ornamental*, Thor., '86: Fr., Aubergine panachée de la Guadeloupe, VIL.: Ger., Gestreifte Riesen-Eierpflanze, Vil.

Fruit obovate, irregularly striped longitudinally, with pale purple on a greenish-white ground; well developed samples 3 in. in diameter, 5 in. through the axis; — plant dwarf, 12 to 18 in. high, green and free from spines throughout; leaves rather large, numerous, thick, nearly entire, the younger ones no more sinuate on the margins than the others; — season late.

Chiefly valued for its variegated fruits, which are quite ornamental.

3. Fruits white or cream-colored.

A. Fruits roundish or ovoid.

No. 9. WHITE, BURR; Thor., '83, '86; VEG. GAR.; Vil.; — *Solanum Ovigerum*, Dun.

Syn. *Round White*, Thor., '83: *White Giant of Naples* ?, Dam., '86: Fr., Aubergine blanche, VIL.: Œuf vegetal, Vil.: Plant aus œufs, Vil.: Pondeuse, Vil.

Fruit of the form and size of a turkey's egg, often somewhat larger; white or yellowish; — plant rather dwarf, considerably branched, green throughout, more or less spiny; leaves large, thick, margins sinuate, but not deeply lobed, younger leaves no more lobed than the older ones, but more undulate on the borders; stem slightly glossy, little downy; — season medium or rather late; plants very productive.

Grown only for ornament. The fruits are inferior in quality to those of the purple varieties, and have even been considered unwholesome.

Correctly figured in Les pl. pot., p. 27; Veg. Gar., p. 234.

B. Fruits distinctly oblong.

No. 10. CHINESE LONG WHITE, Burr.

Syn. Chinese Brinjal, VEG. GAR.; Vil.: *Long White China*, Greg., '83; White Fruited (d), HEN.: *White Long Chinese*, Vil., '83: Fr., *Aubergine blanche longue de Chine*, VIL., '83.

Fruit long oval, or cylindrical, usually curved, glossy white; well developed samples 8 in. long, 2½ in. in longest diameter; — plant rather dwarf, pale green; fruit stems and petioles often slightly tinged with purple; margin of leaves sinuate; — season very late.

Not productive, but the fruit is said to be good when cooked; grown more for ornament or curiosity than as a vegetable.

4. Fruits scarlet.

No. 11. SCARLET FRUITED, Bliss, '83; BURR.

Syn. *Large Scarlet Red*, Dam., '86.

Fruit small, oval, distinctly ribbed longitudinally; bright scarlet, yellow just before maturity; little larger than a hen's egg; — plant very vigorous, with spreading branches; stem, petioles, ribs and veins yellowish green, downy, free from spines; leaves deeply lobed, borders of upper ones undulate; flowers small, pure white.

No. 12. TOMATO-SHAPED RED, Bliss, 83.

Syn. *Scarlet*, Greg., '86: *Scarlet Chinese*, Thor., '83: *Tomato Formed Red*, Ben., '83.

The fruit of this variety bears a striking resemblance both in form and color to that of the Tomato-shaped pepper; well developed samples 2 in. in diameter, 1 in. through the axis; — plant about 20 in. tall, rather compact in appearance; distinct through its thin, clear green, slightly shining, blistered, sharply lobed leaves; stem, petioles, ribs and veins purple, armed with long, very sharp spines; flowers small, white.

Like the Scarlet Fruited, this variety is very late, fruits sparingly, and is grown only for ornament.

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Ferry's Improved Large Purple 3
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THE TOMATO.

[The tomatoes under present cultivation can all be referred to two species, *Lycopersicum pimpinellifolium* and *L. esculentum*, although authors have described the various forms or races under several names, which may be given in the form of synonymy.

LYCOPERSICUM PIMPINELLIFOLIUM.

Annual, stem herbaceous, smooth, weak; leaves quite equally pinnate, leaflets round ovate or cordate, quite entire; racemes simple, naked, long; fruit small, round, smooth, arranged in two ranks. Plant slender and diffuse, not odorous as the common tomato.

Solanum pimpinellifolium. Lin. sp., 1762, 265, Willd. sp., 1797, I, 1033 — Pers. syn., I, 226 — Mill. dict., 1807, n. 32.
Burnet-leaved tunato? Mawe's gard. dict., 1778.
Solanum pimpinellinum, L. (sic). Lam., enc. meth., 1797, IV, 286.
Lycopersicum pimpinellifolium. Dun. sol., 1813, 111.
Grape or Cluster tomato. Burr, veg. of Am., 1863, 646.
Tomato groseille. Vilm., les pl. pot., 1883, 560, fig.
Currant tomato of American seedsmen.

The habitat of this species is given as Peru by Linnæus, Willdenow, Persoon and Miller, and as Peru and Brasil by Dunal. The plant is extremely hardy, vigorous and prolific, the long racemes often containing twenty or more clear, bright red fruits somewhat larger than a very large currant.

LYCOPERSICUM ESCULENTUM.

Annual. Stem herbaceous, hairy, glandular; leaves unequally and interruptedly 1-2 pinnate; leaflets more or less incised and toothed, varying much in varieties, often entire; calyx lobes of variable length in relation to the corolla; flowers often coalescent; fruit 2-many celled, globose, depressed and angular, or elongated; and red, yellow or white in color. Plant weak and decumbent, sub-erect, or occasionally erect.

Var. a. *Cerasiforme.* Stem weak; calyx little, shorter than the corolla; berry globose, small or of medium size, neither ribbed nor angular, borne in clusters, normally 2-celled, red or yellow. Flowers scarcely ever coalescing.

This variety or race has been described under the following names:

1. The red fruited:
   Solanum racemosum cerasorum forma. Bauh. prod., 1620; pin., 1623, 167 — Sloane cat., 1696, 109.
   S. racemosum cerasorum forma C. Bauhini. J. Bauh., 1650, 3, 623.
   Pomum amoris, cujus fructus colore, magnitudine, etc., plane similis erat Strychnodendros. Hernand., 1651, 296, note.
   S. pomiferum fructu rotundo, parvo molli, rubro plano. Mor. hort., bles., 1669, 310 — Mor. ox., 1699, 3, 521 — Rai hist., 1704, supl., 3, 352 — Tourn. inst., 1719, 150 — Tilli. cat. pisan., 1723, 106.
   S. pomiferum, fructu rubro minore. Weinm. phyt., 1745, t. 935, fig. d.
   S. lycopersicum, var. b. Lin. sp., 1762, 265.
   Lycopersicum cerasiforme. Dun. sol., 1813, 113.
   Lycopersicum esculentum, Mill. var. cerasiforme. Gray, syn. fl. 2, 226.
   Red Cherry of American gardens.
2. The yellow fruited:
   Solanum pomiferum fructu rotundo, parvo, molli, luteo, plano. Mor. hort. bles., 1669, 310.

Lycopersicon fructu cerasi, luteo. Tourn. inst., 1719, 150.
S. pomiferum seu Poma amoris fructu luteo minore. Weinm. phyt., 1745, t. 935, fig. c.
Yellow Cherry of American gardens.

This form is spontaneous in the southern borders of Texas (Gray), and I have seen escapes in New Jersey. It is recorded as wild in Jamaica by Sloane and by Lunan, and is said by Dunal to be a native of Peru. It has retained its identity throughout its recorded culture, so far as can be determined by pictures, and seems to have attained to varieties with larger fruit under the conditions induced by culture. The leading character is the globular form of the fruit, and not the size.

Var. b. *Vulgare*. Leafless incised; flowers often coalescent; berry depressed, angular or ribbed, 3-many celled.
Poma amoris, an Glaucium Diosc., Lycopersican quorundum. Lob. obs., 1576, 140, ic.
Pomum amoris sive de oro. Cam. hort., 1588, 130.
Poma amoris. Bassæus ic., 1590, 785—Tab., 1591, 464, ic.; 1613, 493, ic.
Poma amoris, Pomum aureum, Lycopersicum. An Glaucium Diosc. Lob. ic., 1591, 270.
Poma amoris majora. Hernand., 1651, 296.
Poma amoris. Swertius flor., 1654, t. 20.
Solanum lycopersican. Lin. sp., 1762, 265—Willd. sp., 1797, 1, 1033—Lam. enc. meth., 1797, 4, 287; ill. gen., t. 115, fig. 2—St. Hil., exp. des fam. nat., 1805, 1, 290—Mill. dict., 1807, n. 33—DeC. fl. fran., 1815, 3, 614—Thunb. cap., 1825, 188—Mayc. barb., 1830, 98.
Tomate. Long, jam., 1774, 3, 773.
Lycopersicum esculentum. Dun. sol., 1813, 111—Bojer maurit., 1837, 241—Don. gard. dict., 1838, 4, 443.

1. The fruit red or purplish:
Mala aurea (rubrum). Matth., 1558, 479; 1570, 684.
Poma amoris, etc. (purpureus). Pena & Lobel, adv., 1570, 108.
Aurea mala (rubeus). Dod. pempt., 1583, 454, ic., 455; 1616, 457, ic., 458.
Amorous Apples (red). Lyte's dod., 1586, 508.
Poma amoris, Poma aurea (rubra). Cam. ep., 1586, 821, ic.
Poma aurea (rubrum). Lugd., 1587, 1, 628.
Solanum pomiferum fructu rotundo, striato, molli (rubeus). Bauh. phytopin., 1596, 302—Bauh. pin., 1623, 167—Mor. bles., 1669, 195—Rai hist., 1686, 1, 675.
Poma amoris, Apples of Love (red). Ger., 1597, 275, fig.
Solanum pomiferum, fructu rotundo, molli (rubrum). Matth., 1598, 760, ic., 761—Mor. ox., 1699, 3, 520, s. 13, t. 1, f. 7.
Pomum amoris fructu rubro. Eyst., 1613, aut. ord. 1, f. 2.
Pomi d'oro (rosse come sangue). Cast. Dur., 1617, 372, ic.
Mala aurea odore fœtido, quibusdam Lycopersicon (purpurascens). J. B., 1650, 3, 620, ic.
Tomatl (rubrum). Hernand., 1651, 295.
Mala aurea (purpurascens). Chabr., 1677, 525, ic.
Pomum amoris majus fructu rubro. Rai hist., 1688, ap. 2, 1877.

Lycopersicon fructu e rubro pallescente. Tourn., 1719, 150, t. 63.
Lycopersicon Galeni. Morand, 1744, 107, t. 53, f. 8—Tourn., 1719, 150.
Solanum pomiferum fructu rubro majus. Weinm. phyt., 1745, t. 935, f. b.
Pomum amoris, Solanum pomiferum, Lycopersicon (rubrum). Blackw., 1750, t. 133.
Solanum lycopersicum (red). Bryant, fl. diet., 1783, 212.
Morelle pomme d'amour. Descourt. fl. ant., 1827, 6, 95, t. 405.

2. The fruit yellow or orange:

Mala aurea (aureum). Matth., 1558, 479.
Poma amoris, etc. (fulvus). Pena & Lob., adv., 1570, 108.
Aurea mala (aureum luteum). Dod. pempt., 1583, 454, ic., 455; 1616, 457, ic., 458.
Amorus Apples (yellowe). Lyte's dod., 1586, 508.
Poma amoris. Poma aurea (crocea). Cam. ep., 1586, 821, ic.
Poma aurea (aureum). Lugd., 1587, 1, 628.
Solanum pomiferium fructu rotundo, striata, molli (luteum aureum). Bauh. phytopin., 1596, 302—(lutens). Bauh. pin., 1623, 167—(auricolor), Bauh. pin., 1623, 167.
Poma amoris, Apples of Love (yellowe). Ger., 1597, 275, fig.
Solanum pomiferum, fructu rotundo, molli (aureum). Matth., 1598, 760, ic., 761.
Pomum amoris fructu luteo. Eyst., 1613, aut. ord. 1, f. 1.
Pomi d'oro (d'oro). Cast. Dur., 1617, 372, ic.
Mala aurea odore fœtido, quibusdam lycopersicon (ochræum). J. B., 1650, 3, 620, ic.—(aureo), J. B., 1650, 620, ic.
Tomatl, (luteum). Hernand., 1651, 295.
Solanum pomum amoris fructu striato molli aureo. Mor. bles, 1669, 195, 311.
Mala aurea (ochreus). Chabr., 1677, 525, ic.—(aureum), Chabr., 1677, 525, ic.
Pomum amoris majus fructu luteo. Rai hist., 1688, ap. 2, 1879—(aureo) Rai hist., 1688, ap. 2, 1877.
Solanum pomiferum seu Poma amoris fructu striato and sulcata aureo. Mor. ox., 1699, 3, 521, s. 13, t. 1, f. 7.
Solanum pomiferum fructu striato and sulcato aureo. Ray hist., 1704, 3, 352.
Lycopersicum fructu luteo. Tourn., 1719, 150—Tilli. pis., 1723, 106.
Solanum seu Poma amoris fructu luteo. Weinm. phyt., 1745, t. 935, f. c.
Pomum amoris, etc. (luteo). Blackw., 1750, t. 133.
Solanum lycopersicum (deep orange). Bryant, fl. diet., 1783, 212.

3. The fruit white:

Solanum pomiferum fructu rotundo striato molli (albus). Bauh. pin., 1623, 167.
Pomum amoris majus fructu albo. Rai hist., 1688, ap. 2, 1877.
Lycopersicon fructu albo. Tourn., 1719, 150—Tilli. pis., 1723, 106.
Pomum amoris, etc. (albidum). Blackw., 1750, t. 133.
Solanum lycopersicum. Lour. coch., 1790, 130.

4. The fruit versicolored:

Mala aurea odore fœtido quibusdam lycopersicon (versicolor). J. B., 1650, 3, 620. Mala aurea (versicolor). Chab., 1677, 425, ic.

5. Stems variegated.

Amoris pomum II. Blackw., 1750, t. 133.

Dunal, the authority on this subject, gives the habitat as the warmer portions of America, but doubtfully. The species is recorded as growing wild in Cochin China by Loureiro, at the Cape of Good Hope by Thunberg, at the Mauritius by Bojer, and in Central Africa by Grant. It is an American plant and was grown in tropical America in improved varieties at the time of the discovery, for many of the earlier figures in our references exhibit fruit of a form as highly improved as those existing under present culture. For the history of its use in America, see the American Naturalist for July, 1885.

The principal characters are the depressed fruit; these fruits, always more or less angular, may be quite even or ribbed on the same plant. There has been little improvement in form gained within recent times, as the figures in our references quite clearly indicate. That we have gained in flavor, prolificacy and earliness may be claimed, as such claims are difficult to disprove, and represent changes very probably within our power.

Sub-var. *grandifolium*. Leaves very large, 1-pinnate; leaflets few, and entire. The leaves of very young plants entire.

Tomate macrophyllum. Damman & Co. cat., 1884, fig.

Lycopersicum esculentum, var. grandifolium. Bailey, am. nat., June 1887, 576.

Potato Leaf, N. Y. Sta., 1886.

Mikado, N. Y. Sta., 1886.

This section represents plants which have but recently appeared under cultivation. Keyes' Early Prolific, grown by us in 1883, is the first of this class we had seen. In character of fruit, allied to our var. b, but the leaf habit very distinct, and suggesting specific differences.

Sub-var. *validum*. Erect; stem very thick and stout; leaves dark green, short, dense; leaflets wrinkled and recurved.

Tomate à tige raide de Laye. Vil. les pl. pot., 1883, 557, fig. 558.

Station. N. Y. Agr. Exp. Sta. Rept., 1886, 172, fig. p. 173.

Lycopersicum esculentum, var. validum. Bailey, Am. nat. l. c.

Var. c. *Oblongum*. Fruit oblong, or longer through the axis than through the diameter, frequently pear-shaped, fig-shaped, or plum-shaped; 2-celled; color red or yellow.

Solanum pomiferum. Pers. syn., 1805, 1, 226 — Poir. supl., 1813, 3, 759.

Lycopersicum pyriforme. Dun. sol., 1813, 112 — Don. gard. dict., 1838, 4, 443.

Pear-shaped. Hort. trans., 1819, 3, 347.

This form is not recorded as wild, but is noted by Dunal and others as cultivated in botanic gardens. Red and yellow varieties were in American gardens preceding 1848.

We add to this list the following whose characters, as given, scarcely justify specify rank:

Lycopersicum Humboldtii.

Stem herbaceous, hairy; leaves unequally pinnate, hairy; leaflets incised, glaucescent beneath, the lobes of the calyx but half as long as those of the corolla.

Very like L. cerasiforme, but differs in the racemes and flowers being smaller, the berries also smaller and red, in the wild plant but about half the size of those under cultivation. Dun. sol., 112.

The berry is 2-3 celled, smoothish, and when cultivated not less angular than those of L. esculentum, ex Nees. Don, gard. dict., IV, 443.

Lycopersicum Humboldtii. Dun. sol., 1813, 112—Kunth, syn., 1823, 2, 157.

Solanum Humboldtii. Poir. sup., 1813, 3, 759.

Tomato of the island of Cura. Humboldt, trav., Bohn ed., 1852, 2, 20.

This species is found wild in the region of the Rio Negro, South America (Dunal), and is cultivated in the province of Caracas, Venezuela (Kunth), and everywhere in the valleys of Aragua (Humb.). It was grown in Europe in 1822 (Don.)

I suspect the Turban tomato or Turk's Cap to be but a monstrous variety of this species, and that this species may be the original of some of the varieties of the L. esculentum, or cultivated tomato, but far more study must be given before this conclusion can be warranted.]

E. L. S.

Many of the cultivated varieties of the tomato are quite difficult of accurate description owing to the variability in the form and time of ripening of the fruit, and to the want of variety characters in the foliage. Horticultural works furnish little assistance, as comparatively few varieties have been described at all, and the descriptions of these are for the most part quite meager. Almost all of the varieties at present grown in this country are of American origin, and have been introduced within the past quarter of a century.

Several of the varieties of more recent introduction bear a very close resemblance to each other, differing only in such characters as firmness of the flesh, the proportion of seed yielded, etc. As these characters have an economic importance, they cannot be ignored. In this article such distinctions have been recognized wherever they clearly exist.

EXPLANATION OF TERMS.

In respect to size, a fruit measuring more than four inches in transverse diameter is called *very large;* one three to four inches in diameter is called *large;* one two and a half to three inches, *medium,* and one two to two and a half inches in diameter, *small.* Fruits of less diameter than two inches are called *very small.*

In respect to form, the fruit is called *oblate* when its transverse diameter exceeds its axial diameter; *spherical* when the two diameters are about equal, and *oval* when the axial exceeds the transverse diameter. It is said to be *hemispherical* when the contour of a section through the axis approaches a semi-circle, and *pyriform* when it is pear-shaped.

The *outline* of the fruit means the contour of a transverse section through its center. The outline is said to be *angular* when the contour is distorted in obscure angles, and *corrugated* when it bends into scallops or folds. It is *regular* when it exhibits neither angles nor corrugations, but approaches a circle.

The *cavity* and *basin* have the same significance as in pomology, *i. e.*, the former representing the depression about the stem, and the latter in the opposite part of the fruit. The basin is said to be *ringed* when it is bounded by a more or less distinct and regular corky ring, and *fissured* when it contains distinct irregular depressions reaching nearly or quite to the center of the fruit.

The center of the fruit is said to be *well filled* when the cells are chiefly disposed about the outside, leaving the center largely occupied with the pulp.

The terms applied to the foliage are used in their strict botanical sense.

The flavor of the fruit is not often specified, as I have been able to detect little difference in this respect except as between fruits of different color. The fruits of the white and yellow varieties are less acid than those of the scarlet ones, and those of the purplish red tint are in general rather harsher in taste than those of other shades. But with a very few exceptions, other differences have not seemed sufficiently marked for specification.

ANALYTICAL KEY.

As an aid in naming varieties, the following analytical key is arranged:

1. Plant strongly scented, stem hairy, leaves unequally one to two pinnate *(Lycopersicum esculentum)*.
    A. Stem weak; plant decumbent.
        a. Leaflets numerous, toothed, more or less pinnate *(var. vulgare)*.
            *. Fruit more than two-celled, with a more or less distinct cavity about the stem.
                ‡. Fruit deep scarlet.
                    §. Outline angular or corrugated. Nos. 1–24, incl.

§§. Outline regular or nearly so. Nos. 25–27, incl.

‡‡. Fruit purplish red.

§. Outline angular or corrugated. Nos. 38–39.

§§. Outline regular or nearly so. Nos. 40–45, incl.

‡‡‡. Fruit yellow or orange.

§. Outline angular or corrugated. Nos. 46–48, incl.

§§. Outline regular or nearly so. Nos. 49–51, incl.

‡‡‡‡. Fruit whitish. No. 52.

**. Fruit two (sometimes three) celled, without a cavity about the stem.

†. Fruit spherical *(var. cerasiforme)*.

‡. Fruit deep scarlet. No. 53.

‡‡‡. Fruit yellow. No. 54.

††. Fruit oval or pyriform (var. *oblongum*).

‡. Fruit deep scarlet. Nos. 55–57, incl.

‡‡‡. Fruit yellow. Nos. 58–59.

b. Leaflets few and very large, never pinnate, nearly or quite entire. (Sub–var. *grandifolium*).

‡. Fruit deep scarlet.

§. Outline angular or corrugated. No. 60.

‡‡. Fruit purplish red.

§. Outline angular or corrugated. No. 61.

§§. Outline regular. No. 62.

B. Stem stocky, plant erect or nearly so. (Sub–var. *validum*).

‡. Fruit deep scarlet.

§. Fruit angular or corrugated. No. 63.

§§. Fruit regular or nearly so. No. 64.

2. Fruit not strongly scented, stem smooth, leaflets entire *(Lycopersicum pimpinellifolium)*.

‡. Fruit deep scarlet. No. 65.

Description of the Varieties.

1. Plant strongly scented, stem hairy, leaves unequally one to two pinnate. — *(Lycopersicum esculentum.)*

A. Stem weak, plant decumbent.

a. Leaflets numerous, toothed, more or less pinnate, (var. vulgare).

***. Fruit more than two-celled, with a more or less distinct cavity about the stem.**

‡. Fruit deep scarlet.

§. Outline angular or corrugated.

No. 1. ALPHA, Thor., '83, '87.

Fruit medium to large; strongly oblate, the more regular samples inclining to hemispherical; outline almost always more or less angular and often corrugated; cavity medium or shallow, furrowed; basin small or wanting in the well-formed fruits, with a russet spot at the center, usually more or less ringed and fissured in the larger fruits; cells 6 to many; flesh moderately firm; — plant rather feeble; calyx segments a little more than half as long as the corolla ; — season early.

No. 2. ARLINGTON, Greg., '83, '87.

Fruit medium to very large; strongly oblate; outline usually more or less angular, often corrugated; cavity medium, deeply furrowed; basin sometimes almost wanting in the smaller fruits, being marked only by a very small fissure surrounded by a small russet ring; in the larger fruits the basin is often very irregular; cells 5 to many, small; flesh very thick and firm; — plant very vigorous; — foliage rather pale green, leaflets rather broad; calyx segments a little shorter than the corolla; — season rather late.

No. 3. BERMUDA, Land., '87. (Not of Burr.)

Syn. *Extra Early or Cluster*, Land., '87.

Fruit medium to large; oblate; outline extremely irregular, angular in the smaller and deeply corrugated in the larger fruits; cavity shallow, deeply furrowed in the larger fruits; basin wanting in all except the largest samples, in which it is fissured, but without a defined ring; cells numerous and very large; flesh thin, remarkably soft; — plant

moderately vigorous; leaves deep green, somewhat shriveled, seldom 2-pinnate; calyx segments about equal in length to the corolla.

A very early variety, but quite worthless when better sorts are obtainable.

No. 4. BLOUNT'S CHAMPION CLUSTER, Thor., '83.

The fruit resembles that of the Trophy, and is borne in clusters of 2 to 5; leaflets somewhat broader than those of the Trophy; — season medium.

No. 5. BOSTON MARKET, Greg., '83, '85, '87.

Syn. *Fulton Market* (incorrectly), Till., '85.

Fruits a little less oblate, and slightly more regular than those of Alpha, maturing also a trifle later, but scarcely differing in other respects.

No. 6. BRONZE FOLIAGE TROPHY, Thor., '86.

Syn. *New Bronze-Leaved*, Greg., '87.

Scarcely distinct from the Trophy with the exception that the foliage is of a very peculiar deep bronze green. The fruit, like that of the Trophy, is of excellent quality, but rarely regular in form. It ripened somewhat earlier than that of the Trophy.

No. 7. BUNKER HILL, Bliss, '87.

Resembles Great Chihuahua, but the foliage is paler, the fruit averages a trifle smaller, slightly less corrugated, and matures very much earlier, being one of the earlier varieties; flesh thin, moderately firm, ripens unevenly; of no value as compared with the many superior varieties.

No. 8. EARLY JERSEY, Land., '87.

Resembles the Trophy, but the fruit is smaller, somewhat less corrugated, and ripens considerably earlier. The skin is often roughened about the stem, both in the green and ripe fruit, with shallow circular cracks.

It was recommended as being first early, but did not prove so at the Station.

No. 9. FAULTLESS, Greg., '87.

Closely resembles the Conqueror, but the fruit is less oblate, more regular in outline, and not quite so early in ripening.

No. 10. FULTON MARKET, Greg., '87.

The fruit is scarcely distinguishable from that of General Grant, but the foliage differs in having the leaflets broader, less closely set, and

rather less deeply cut. The calyx segments are also rather shorter as compared with the corolla. In season, the two are about the same.

No. 11. GEN. GRANT, BRILL; HEN.; Sib., '83; Vick, '87.

Syn. *Conqueror*, Sib., '83; Thor., '87: *Early Conqueror*, Fer., '83.

Fruit medium, occasionally large, often considerably splashed with bronze; rather strongly oblate; outline usually angular, and sometimes corrugated; cavity medium, usually slightly furrowed; basin not much hollowed, sometimes fissured, and occasionally very irregular, but never clearly ringed; cells 6 to many, usually small; flesh rather thick, but quite soft; — plant feeble, leaves usually twice-pinnate in the lower half; leaflets narrow, rather closely set and deeply cut, much shriveled; calyx segments about equal in length to the corolla; — season early.

No. 12. GIANT OF SMYRNA, Dam., '86.

Fruit small to very small, oblate; outline corrugated; cells numerous; flesh soft; plant moderately vigorous; leaflets rather small; — season medium.

Of no value for this climate.

No. 13. GOOSEBERRY FRUITED, H. & S., '86.

Similar to the Giant of Smyrna; fruit a little larger, and more corrugated; flesh very soft; — plant very feeble, foliage much shriveled.

Of no value for this climate.

No. 14. GREAT CHIHUAHUA, Greg., '83.

Syn. *Mexican Mammoth*, S. E. Mitchel, '85: *President Garfield*, Sib. '83, '87. Probably the Giant (Syn. Mammoth) of BURR.

Fruit of the largest size, sometimes 5 in. in diameter; strongly oblate; outline deeply corrugated; cavity broad, much furrowed; basin exhibiting every shade of deformity; cells very numerous, usually small; flesh thick, center usually well filled; sometimes a secondary series of cells is formed at the center; — plant very vigorous, leaves largely 2-pinnate; calyx lobes nearly or quite as long as the corolla; — season late.

No. 15. HOWARD, Greg., '83.

Closely resembles the Arlington, but produces more small fruits; in season the two are the same.

No. 16. HUBBARD'S CURLED LEAF, Sib., '83; Vick, '87.

Syn. *Early York*, Greg., '83: *Dwarf Striped Japanese*, Ben., '86: *San Salvador* ?, Dam., '86: Fr., *Tomate du Japan naine striée*, Ben., '86.

Fruit medium to small; strongly oblate; outline always more or less

angular, often deeply corrugated; cavity medium, often very deeply furrowed; basin wanting; in the smaller fruits the center is marked by a very small spot, in the larger ones it is often very irregular; cells 4 to many, often not filled by the seeds; flesh thick, soft, center not well filled; — plant not vigorous, very spreading, foliage much shriveled; older leaves often twice-pinnate in the lower half; leaflets not much cut, segments rather rounded than pointed; calyx segments nearly or quite as long as corolla.

One of the earliest varieties, but aside from this is without merit.

No. 17. HUNDRED DAY, Thor., '83, '87.

Resembles Hubbard's Curled Leaf, but the fruit averages rather smaller; the plant is decidedly less vigorous, and the leaflets narrower and more closely set; very strongly shriveled, and late in the season much blighted; calyx segments half to three-fourths as long as the corolla. Like the Hubbard's Curled Leaf, it has no merit except its great earliness.

No. 18. ORANGEFIELD, Greg., '83.

Syn. *Dwarf Orangefield,* Sib., '87.

Fruit small, averaging about 2 in. in diameter; roundish or slightly oblate, sometimes inclining to conic; outline somewhat angular, the surface presenting 2 or 3 rather obscure longitudinal furrows, corresponding to the number of cells; cavity very slight, scarcely furrowed; basin wanting; flesh thick, moderately firm; — plant very vigorous, leaves usually 2-pinnate; segments of leaflets very bluntly pointed; calyx segments as long as corolla; — season medium.

The fruit detaches very easily, with the calyx and a short section of the stem.

No. 19. PRECURSOR, B. M. & CO., '84.

Syn. *Early Richmond,* Land., '85, '87.

Fruit medium to large; rather strongly oblate; outline angular, often corrugated; cavity deeply furrowed; basin usually very slight, the center often marked by a mere russet spot; in the larger fruits ringed, fissured, and often extremely irregular; cells 5 or 6, sometimes many, rather large; flesh moderately firm, the center not well filled; — plant not vigorous; foliage dull, slightly grayish green; leaves often 2-pinnate in the lower half, calyx lobes as long as corolla.

Early, but otherwise without merit.

No. 20. QUEEN, Hen., '84.

Syn. *Improved Queen*, Thor., '86, '87: *Red Valencia Cluster*, Thor., '83.

Fruit uniformly large; strongly oblate; outline usually angular, and often much corrugated; cavity deep, but narrow, more or less, often deeply furrowed; basin sometimes wanting, the center marked only by a russet spot, often ringed and fissured; cells numerous, small; flesh thick, rather firm, center well filled; — plant vigorous; leaves often 2-pinnate in the lower half, calyx segments as long as the corolla; — season medium.

Another Queen tomato, Fer., '84, Hen., '87, was quite distinct from the above, having the fruit very regular, closely resembling that of Livingston's Favorite, with rather light green foliage and broad leaflets.

No. 21. SANTA CATERINA, H. & S., '86.

Resembles the Great Chihuahua, but the fruit is not quite so large; extremely corrugated.

No 22. TRIUMPH, Greg., '83.

Syn. *Island Beauty*, Hen., '87: *Large Smooth Red*, Thor., '87: *Reade's Island Beauty*, Thor., '83.

Fruit medium to large; strongly oblate; outline very irregular, often much corrugated; cavity broad, often very deeply furrowed; basin shallow and broad, with a rather large russet spot at the center in the more regular fruits, often much distorted and fissured, but rarely ringed; cells numerous, usually small; flesh rather soft, center well filled; — plant not very vigorous, leaves almost always 2-pinnate in the lower half; leaflets rather deeply cut, often much shriveled; calyx segments nearly or quite as long as the corolla; — season medium.

No 23. TROPHY, BRILL; HEN., '83, '86; Thor., 87; Vil.

Syn. Large Red Smooth Trophy, A. de Cl.: Fr., Tomate rouge grosse lisse, VIL.: Ger., Rothe grossfrüchtige glattschalige Tomate, A. de Cl.

Fruit large to very large; rich scarlet; strongly oblate; outline more or less often very irregular, often much corrugated; cavity shallow, distinctly furrowed; basin rarely regular, exhibiting all shades of deformity in the larger fruits; cells numerous, usually small; flesh thick, rather firm, center very well filled; — plant vigorous; leaves usually 2-pinnate in the lower half; flowers large, often abortive; calyx lobes nearly or quite as long as corolla; — season rather late.

Formerly very popular, and still quite largely grown. Its tendency to irregularity in the fruit is its chief fault.

No. 24. TURK'S CAP,? '82.

Syn. *Turban,?* '82; Fr., Tomate Bonnet turc, Vil.: Ger., Scharlachrother Turkenbund Tomate, Vil.

Fruit small, produced in clusters of ten to fifteen; somewhat oblate, but with a peculiar protuberance in the part opposite to the stem, caused by an abnormal development of a part of the carpels; outline more or less angular, sometimes somewhat corrugated; cavity small, distinctly furrowed; — plant remarkably vigorous and productive; — season very early.

Of no value either for the table or market.

Correctly figured in Gregory's catalogue of 1882.

§§. Outline regular or nearly so.

No. 25. AUTOCRAT, Sib., '86, '87.

The fruit averages a little smaller than that of Livingston's Perfection; otherwise the two appear identical.

No. 26. CARDINAL, Greg., 84; Thor., '87.

Syn. *Burpee's Cardinal,* Burpee, '86.

Fruit scarcely distinct from that of Livingston's Perfection, except in yielding fewer seeds.

No. 27. COOK'S FAVORITE, BRILL; Greg., '83.

Very similar to the Little Gem, with the exception that the fruits average one-half larger. In season and qualities they are the same.

Another Cook's Favorite, Land., '87, was entirely distinct from the above, the fruits being medium to large, and very regular. The stock was mixed, however, some plants bearing scarlet and others purplish red fruits.

No. 28. EARLY ADVANCE, Thor., '87.

Syn. *Essex Round Red Smooth,* Greg., '85, '87: *Large Round Red Smooth.* Greg., '87.

Fruit small to medium; oblate, inclining to hemispherical; cavity shallow, scarcely furrowed; basin wanting, the center marked by a russet spot of variable size and form; cells 3 to 8; flesh moderately firm, ripening very evenly; — plant vigorous; leaves rather largely 2-pinnate; calyx segments rather shorter than corolla; season early.

No. 29. EARLY SMOOTH RED, Vick., '87.

Syn. *Early Red Smooth,* Thor., '83: *Early Round Red Smooth,* Greg., '83: *Extra Early Red,* Sib., '83: *Extra Early Trophy,* J. & S., '86: — Probably the White's Extra Early (Syn. Early Red, Extra Early) of BURR.

Fruit medium to small, produced in clusters of 3 to 5; oblate; outline rather regular; cavity shallow, very slightly furrowed; basin wanting, the center marked by a small dot; cells usually 3 or 4 large; flesh rather soft, center not well filled; — plant moderately vigorous; foliage usually more or less shriveled; calyx segments rather shorter than corolla.

A very early variety, but too soft for market purposes.

No. 30. HATHAWAY'S EXCELSIOR, Sib., '83; Veg. Gar.; Vick, '87; Vil.

Syn. Apple-Shaped Red, VEG GAR.: Large Smooth, Vil.: Fr., Tomate pomme rouge, VIL.

Fruit medium to small, produced in clusters of two to six; slightly oblate, inclining to hemispherical; cavity very small, or wanting, usually not furrowed; basin wanting; cells 3 to 5, medium to large; flesh thick, very firm, center not very well filled; — plant vigorous, leaves seldom 2-pinnate; calyx segments rather shorter than corolla; — season early.

No. 31. LITTLE GEM, Greg., 87; Thor., 83.

Fruit very small, larger ones about 2 in. in diameter; slightly oblate; cavity very slight, not furrowed; basin none, in the smaller fruits, the center marked only by a small spot; in the larger ones it is ringed and fissured; cells 6 to 8, very small; flesh rather thin, remarkably firm, center very well filled; — plant feeble, leaves 2-pinnate in the lower half; leaflets narrow, considerably shriveled, closely set; deeply cut; calyx lobes $\frac{1}{2}$ to $\frac{3}{4}$ as long as corolla; — season very early.

No. 32. LIVINGSTON'S FAVORITE, Greg., 83; Land., 84, '85; Liv., '86, '87; Thor., '87.

Syn. *New Jersey*, Thor., '87: *Optimus*, Fer., '85; Thor., '87: *The Favorite*, Greg., '85.

Closely resembles Livingston's Perfection, differing from it in the fruit being somewhat less oblate, better filled at the center, and in producing less seed. In season it is about the same, though it is said to ripen more of its fruit early.

One of the most popular of all varieties for table use and market, and it is said to be especially valuable for canning.

Introduced by Mr. A. W. Livingston, of Des Moines, Ia.

No. 33. LIVINGSTON'S PERFECTION, Sib., '83; Liv., '87; Thor., '87.

Syn. *Market Champion*?, J. & S., '86: *Perfection*, Hen., '84.

Fruit medium to very large; oblate, but inclining to hemispherical; outline almost always regular, the largest samples sometimes a little

angular; cavity small, sometimes obscurely but never distinctly furrowed; basin wanting, the center marked by a small russet spot; cells 5 to many, often rather large; flesh thick, rather firm, usually well filled at the center; — plant very vigorous; leaves 2-pinnate in the lower half; leaflets rather remote and deeply cut; calyx lobes nearly or quite as long as the corolla; — season medium.

An excellent variety either for the table or market.

Introduced by A. W. Livingston, of Des Moines, Ia.

No. 34. MAYFLOWER, ?, '82; Vick, '87.

Syn. *Emery*, Farq., '85. *Improved Mayflower*, D. of A., '87: *Rawson's Puritan*, Raw., '87.

Scarcely distinct from Livingston's Favorite. The only difference noticed was that the fruits averaged very slightly smaller.

Introduced in 1882 by F. H. Horsford, of Charlotte, Vt.

No. 35. NEW RED APPLE, Greg., '84, '85, '87.

Differs from the Livingston's Favorite only in having slightly smaller fruit.

No. 36. PARAGON, Hen., '86; Liv., '86.

Syn. *New Paragon*, Thor., 87.

Closely resembles the Livingston's Perfection. The fruit is not quite so regular, and averages rather larger.

Introduced by A. W. Livingston, of Des Moines, Ia.

No. 37. TILDEN'S NEW, Greg., '83, '87.

Rather closely resembles Hathaway's Excelsior, but the fruit is not quite so regular and ripens less evenly, and the plant is less vigorous. In season they are about the same.

‡‡. **Fruits purplish red.**

§. **Outline angular or corrugated.**

No. 38. FEEJEE ISLAND RED, Thor., '83.

Syn. *Feejee Improved*, Greg., '87: *Feejee Island* (d), WHITE.

The Feejee of Burr, also the Perfected, Syn. Lester's Perfected, It., Pomo d'Oro Lesterano, is very probably this variety. The names Fidgi Island of Vil. and Fiji Island of Veg. Garden refer to a distinct sort.

Fruit large to very large, red, with numerous and somewhat conspicuous whitish specks sprinkled over the surface; oblate; outline angular, and sometimes rather strongly corrugated; cavity medium;

basin small in the more regular fruits, with a rather large russet spot at the bottom, ringed and fissured, often much distorted in the larger fruits; cells numerous, but usually small; flesh very thick, center remarkably well filled; firm; — plant extremely vigorous; foliage deep, dull, grayish green, leaflets broad, strongly blistered, deeply cut; calyx segments nearly or quite as long as corolla; — season very late.

No. 39. ROCHESTER, Sib., '83, '85, '87.

Syn. *Rochester Favorite*, Greg., '87.

Fruit scarcely distinguishable from that of the Mikado; — plant rather vigorous; leaves usually two-pinnate in the lower half; leaflets little blistered, rather remote, on rather long petioles, deeply cut, with rather sharp segments; — season medium.

Introduced by Hiram Sibley & Co. in 1883.

§§. Outline regular or nearly so.

No. 40. ACME, HEN.; Thor., '87; Veg. Gar.; Vil.

Syn. Apple-Shaped, VEG. GAR.: *Early Acme*, Liv., '86: *Hovey*, Thor., '87: *Jones' Early Hybrid*, Ev., '85: *Livingston's Acme*, Greg., '85: Fr., Tomate pomme violette, VIL.

Fruit medium, oblate, inclining to hemispherical; cavity shallow, usually slightly furrowed; basin usually none; skin very thin and delicate; cells 3 to 7; flesh very firm, ripens uniformly; — plant moderately vigorous; leaves largely 2-pinnate, leaflets thin; calyx segments a little shorter than the corolla.

An early variety, introduced by Mr. A. W. Livingston, of Des Moines, Ia. Its purplish color and somewhat harsh flavor are objected to by some; its thin skin does not bear shipping long distances and late in the season the fruits become rather small. But despite these faults it continues to be very popular in many localities.

No. 41. BURPEE'S CLIMAX, Burpee, '86.

Fruit of the size, form and regular outline of the Livingston's Favorite, but of the purplish red color of the Acme; — plant moderately vigorous; — season medium.

No. 42. CRITERION, Greg., '83, '87; VEG. GAR.; VIL.

Fruit small, averaging about $2\frac{1}{4}$ in. in diameter in both directions; obscurely cylindrical; outline regular or slightly angular; cavity very slight, often obscurely furrowed; basin wanting, the center marked only by a minute dot; cells usually 3 or 4; flesh very thick,

moderately firm; — plants very vigorous; leaves largely 2-pinnate; leaflets somewhat shriveled; calyx segments nearly or quite as long as the corolla; — season rather early.

No. 43. ESSEX HYBRID, Thor., '87.

Syn. *Essex Early Hybrid*, Sib., '83.

Very closely resembles the Acme, but the foliage is more vigorous. It has often been called a synonym of the Acme.

No. 44. LIVINGSTON'S BEAUTY, Liv., '86, '87; Thor., '87.

Closely resembles the Acme, though said to be distinct from it in parentage. It differs from the Acme in being less oblate, having more solid flesh, and in producing less seed, with a rather more stocky plant. The size of the fruit also holds out rather better late in the season.

Introduced in 1886 by Mr. A. W. Livingston, of Des Moines, Ia.

No. 45. PEACH, Land., '87.

Fruit very small, the largest rarely 2 in. in diameter; of a peculiar dull purplish red, sometimes with distinct yellowish spots about the stem; globular but almost always a little angular, not longitudinally furrowed; cavity small; basin wanting; cells 3; flesh rather thin, not firm, with a sweet, pleasant flavor; — plant rather vigorous; foliage dull, slightly grayish green; leaves largely two-pinnate; leaflets not much blistered, very deeply cut, with sharp segments; flowers a shade lighter than in most other varieties; calyx lobes nearly or quite as long as the corolla; — season medium.

When not quite ripe, the fruit bears a rather striking resemblance to a rosy peach.

‡‡‡. Fruit yellow or orange.

§. Outline angular or corrugated.

No. 46. GOLDEN TROPHY, Thor., '83; Land., '85, '87.

Said to be a sport from the Trophy, differing from it in having somewhat smaller pale yellow fruit that often inclines a little to red; and a rather more vigorous plant. The flesh is often slightly tinged with red.

No. 47. LARGE YELLOW, Thor., '87.

Fruit medium to small; bright, clear yellow; strongly oblate; outline extremely irregular, always more or less angular or corrugated; cavity medium to large, often very deeply furrowed; basin wanting,

the center marked by a mere dot in the more regular fruits, other samples representing all degrees of distortion; cells 8 to many, usually small, not always filled by the seeds; flesh rather soft, center very well filled; — plant very vigorous; leaves 2-pinnate in the lower half; leaflets rather deeply cut; calyx lobes nearly or quite as long as the corolla; — season medium.

No. 48. YELLOW VICTOR, Greg., '83, '87.

Fruit of medium size, bright, clear yellow; oblate; outline usually more or less angular, sometimes corrugated; cavity very small, scarcely furrowed; basin wanting in the smaller fruits, often fissured in the larger ones; cells 5 to 9, usually small; flesh moderately firm, center well filled; — plant moderately vigorous; leaves usually 2-pinnate in the lower half; leaflets rather strongly blistered and deeply cut; calyx segments $\frac{1}{2}$ to $\frac{3}{4}$ as long as the corolla; — season medium.

§§. Outline regular or nearly so.

No. 49. GOLDEN QUEEN, Liv., '85; Vil., '87.

Syn. Fr., *Tomate jaune grosse lisse*, Vil., '87.

Fruit large, light clear yellow; oblate; outline rarely somewhat angular; cavity small, usually little furrowed; basin small, with an inclination to become ringed, rarely sufficiently irregular to deform the fruit; cells numerous, small; flesh very thick, moderately firm, center well filled; — plant very vigorous; leaves not often 2-pinnate, leaflets very broad except toward the terminii of the branches, little blistered; — season medium.

Another GOLDEN QUEEN, seed from Thor., '87, was distinct from the above in having the fruit of medium size, and showing a considerable inclination toward red in the part opposite to the stem. The leaflets were also rather narrower, and the fruit ripened slightly earlier.

No. 50. GREEN-GAGE, Fer., '83; Thor., '83, '87; VIL.

Syn. *Carter's Green-Gage*, Ben., '86: Greengage, VEG. GAR: *Large Yellow*, Hen., '84; Yellow Plum, Vil.: Fr., Tomate jaune ronde, Vil.

Fruit small to very small, produced in clusters of 4 to 6; rich deep yellow; slightly oblate, inclining to spherical; cavity almost wanting, not furrowed; basin none; cells 2 to 5, large; flesh thick, rather soft, with a pleasant slightly acid flavor, center not well filled; — plant very vigorous; leaves rarely 2-pinnate; leaflets rather broad, considerably blistered; calyx segments nearly or quite as long as corolla.

One of the earliest varieties, but owing to its small size and soft texture is little used except for preserves. The skin cracks badly about the stem in wet weather.

Correctly figured in Veg. Gar., p. 571.

No. 51. IMPROVED LARGE YELLOW, Thor., '83, '87.

Resembles the Green Gage, but the color is deeper, approaching orange, the outline not quite so regular, the flesh firmer, and the skin does not crack so much about the stem in wet weather. The plant is rather less vigorous and the leaflets are often 2-pinnate in the lower half. In season it is considerably later than the Green Gage.

††††. Fruit whitish.

No. 52. IVORY BALL, Land., '87.

Syn. *New White Apple*, Thor., '83.

Fruit very small, the larger samples 1½ to 2 in. in diameter, produced in clusters of 2 to 8; rather rich yellow about the stem, shading to nearly pure white in the opposite part, finely mottled with pure white specks; slightly oblate, approaching spherical; cavity very slight, sometimes obscurely furrowed; basin wanting; cells 2, 3 or 4; flesh thick, rather firm; plant very vigorous; leaves 2-pinnate in the lower half; leaflets deeply cut; calyx segments nearly or quite as long as corolla; — season medium.

**. Fruit two (sometimes three) celled, without a cavity about the stem.

†. Fruit spherical, *(var. cerasiforme)*.

‡. Fruit deep scarlet.

No. 53. RED CHERRY, Sib., '83; Thor., '87; Vil.

Syn. Cherry, Vil.: Fr., Tomate cerise, VIL.: Ger, Kirschförmige rothe Tomate, Vil.

Fruit very small, the largest about one inch in diameter, produced in clusters of 4 to 9; spherical; outline entirely regular; cavity and basin wanting; cells 2; flesh very thin; soft; — plant remarkably vigorous; foliage very deep clear green; leaves largely 2-pinnate; leaflets small, closely set, racemes simple, 2-ranked; calyx lobes one half to quite as long as the corolla; — season very early.

Correctly figured in Les pl. pot., p. 559.

‡‡‡. Fruit yellow.

No. 54. YELLOW CHERRY, Thor., '87, ?, '82.

Differs from the Red Cherry in having bright clear yellow instead of scarlet fruit, and in its foliage being a faint shade lighter in color.

††. Fruit oval or pyriform, *(var. oblongum)*.

‡. Fruit deep scarlet.

No. 55. KING HUMBERT, Thor., '85.

Syn. *Early King Humbert*, Thor., '87: *Wonder of Italy*, Dam., '86.

Fruit very small, about $1\frac{3}{4}$ in. in diameter; pyriform, sometimes approaching oval; slightly flattened and obscurely furrowed on two opposite sides; cavity and basin wanting; cells 2 sometimes 3, rather large; flesh remarkably thick and firm; — plant vigorous; leaves usually 2-pinnate in the lower half; calyx lobes rather shorter than corolla.

The fruit is produced in clusters of 5 to 9, and ripens early. The calyx does not usually come off with the fruit.

The cut of this variety as given in Veg. Gar., p. 573, does not represent the King Humbert as grown at the Station.

No. 56. NESBIT'S VICTORIA, Till., '85.

Syn. Nisbett's Victoria (d), Vil.

The fruit resembles rather closely that of the King Humbert, but the foliage is quite distinct, the leaflets being remarkably large; not, however, resembling those of the Mikado type.

No. 57. PEAR-SHAPED, Thor., '87; Vil.

Syn. Fig, BURR; Vil.: Fr., Tomate poire, VIL.: Ger., Birnförmige rothe Tomate, Vil.

Fruit very small, the largest about 2 in. long, 1 in. in longest diameter; obovate or pyriform, usually obscurely 4-sided, with 2 obscure longitudinal furrows on opposite sides, but sometimes entirely smooth; cavity and basin wanting; cells 2; flesh thick, remarkably firm; — plant extremely vigorous; leaves not much blistered; calyx lobes $\frac{1}{2}$ to $\frac{3}{4}$ as long as corolla; — season early.

Correctly figured in Les pl. pot., p. 560.

†††††. Fruit yellow.

No. 58. YELLOW PEAR-SHAPED, Burr.

Syn. *Pear-Shaped Yellow*, Sib., '83; Thor., '87: *Yellow Fig*, Burr; Greg., '83, '87.

Scarcely differs from the Pear-shaped except in the color of the fruit, which is bright clear yellow instead of scarlet.

No. 59. YELLOW PLUM, Burr; Thor., '83, '87.

Differs from the Yellow Pear-shaped chiefly in having oval rather than pyriform fruit.

b. Leaflets few and very large, never pinnate, nearly or quite entire. (*Sub-var. grandifolium.*)

‡. Fruit deep scarlet.

§. Outline angular or corrugated.

No. 60. BROAD-LEAVED DWARF, Thor., '83.

Syn. *Keye's Early Prolific*, Greg., '83.

Fruit medium to small, produced in clusters of 2 to 6; strongly oblate; outline usually more or less angular, sometimes corrugated; cavity shallow, very little furrowed; basin wanting in the more regular fruits; cells 4 to 7; flesh rather firm; — plant moderately vigorous; foliage very similar to that of the Mikado; — season very early.

‡‡. Fruit purplish red.

§. Outline angular or corrugated.

No. 61. MIKADO, Hen., '86; Thor., '87.

Syn. *Turner's Hybrid*, Thor., '87.

Fruit large to very large; strongly oblate; outline often strongly corrugated; cavity deep, broad, distinctly, often deeply furrowed; basin shallow, irregular, often much fissured and distorted; cells numerous, small; flesh thick, moderately firm, center very well filled; — plant vigorous; foliage pale green; leaves never 2-pinnate; leaflets rarely more than 5, oblong cordate, rarely equal at the base, surface strongly blistered, more or less waved; calyx lobes as long as the corolla.

§§. Outline regular.

No. 62. POTATO LEAF, Liv., '86.

A tomato of which the fruit scarcely differs from that of the Acme except in being rather firmer; and the foliage from that of the Mikado except that it is deeper green. In season it is about the same as the Acme.

Introduced by Josiah Livingston, of Des Moines, Ia., in 1886.

B. Stem stocky, plant erect or nearly so (*sub-var. validum*).

‡. Fruit deep scarlet.

§. Fruit angular or corrugated.

No. 63. TREE, BURR.; Vil.; Thor.?, '82.

Syn. *Greneir*, Ben., '86: *New French Upright*, Thor., '83: New Upright, Burr: Upright, Vil.: Fr., Tomate à tige raide de Laye, VIL.: T. de Laye, Burr: *T. Grenier à tige raide de Laye*, Ben., '86: *T. rouge à tige raide de Laye*, Ben., 86.

Fruit large; oblate; outline usually more or less corrugated; basin irregular, often fissured; cells numerous, small; flesh firm, center very well filled; — season very late.

The fruit is of excellent quality, but so late as to be of little value in the Northern States.

§§. Fruit regular or nearly so.

No. 64. STATION, N. Y. Agr. Exp. Sta., '86, '87.

Fruit medium to small; slightly oblate, sometimes inclining to spherical; outline regular, or slightly angular; cavity small, usually slightly furrowed; basin wanting, the center marked by a small dot; cells 4 to 8; flesh thick, moderately firm, center usually well filled; — season very early.

Originated at the New York Agricultural Experiment Station in 1883, from the Tree tomato fertilized with the Alpha.

2. Plant not strongly scented, stem smooth, leaflets entire (*Lycopersicum pimpinellifolium*).

‡. Fruit deep scarlet.

No. 65. NEW CURRANT, Thor., '83, '87.

Syn. Red Currant, Vil.: Ger., Johannisbeer Tomate, Vil.: Trauben T., A. de Cl.

Already well described in the introduction under the name *Lyco persicum pimpinellifolium*. The fruits rarely exceed ½ in. in diameter are 2, rarely 3 celled, with thin but remarkably firm flesh; foliage very

pale green, leaves never 2-pinnate; leaflets nearly smooth; flowers small, bright yellow, never united, petals long and narrow; calyx lobes less than half as long as the corolla.

Grown for preserves and for ornament. The fruit ripens extremely early, commencing at the base of the racemes.

Correctly figured in Les. pl. pot., p. 560.

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Rothe grossfrüchtige glattschatige Tomate 23

Santa Caterina 21
Scharlachrother Türkenbund Tomate 24
Station 64
The Favorite 32
Tilden's New 37
Tomate à tige raide de Laye 63
Bonnet turc 24
cerise 53
de Laye 63
du Japon naine Striée 16
Greneir à tige raide de Laye 63
jaune grosse lisse 49
jaune ronde 50
poire 57
pomme rouge 30
pomme violette 40
rouge à tige raide de Laye 63
rouge grosse lisse 23
Trauben Tomate 65
Tree 63
Triumph 22
Trophy 23
Turban 24
Turk's Cap 24
Turner's Hybrid 61
Upright 63
White's Extra Early 29
Wonder of Italy 55
Yellow Cherry 54
Yellow Fig 58
Yellow Pear-Shaped 58
Yellow Plum 50
Yellow Plum 59
Yellow Victor 48

EXPLANATION OF ABBREVIATIONS.

In order to economize space, the following abbreviations of the names of seedsmen are used in the Reports of the Horticulturist and Assistant Horticulturist.

An abbreviation of the name of a seedsman attached to a variety, indicates the source of the seed, and the date following, the year in

which it was obtained. In the Report of the Assistant Horticulturist, the date is omitted in all seeds obtained in 1887.

Alb.— Silas L. Albertson, Roslyn, L. I., N. Y.
Alex.— O. H. Alexander, Charlotte, Vt.
Ans.— A. H. Ansley & Sons, Milo Center, Yates Co., N. Y.
Ben.— Ernst Benary, Erfurt, Germany.
Bliss — B. K. Bliss & Sons, New York, N. Y.
Brill — Francis Brill, Riverhead, L. I., N. Y.
Carter — Carter & Co., London, England.
Cleve.— A. B. Cleveland, Cape Vincent, N. Y.
Coy — E. L. Coy & Son, West Hebron, Washington Co., N. Y.
Dam. — Damman & Co., Portici, Italy.
D. of A.— Department of Agriculture, Washington, D. C.
Ev. or Evt.— J. A. Everitt & Co., Indianapolis, Ind.
Farq.— R. & J. Farquhar & Co., Boston, Mass.
Ferry — D. M. Ferry & Co., Detroit, Mich.
Foote — A. J. Foote, Terre Haute, Ind.
Greg.— J. J. H. Gregory, Marblehead, Mass.
Hen.— Peter Henderson & Co., New York, N. Y.
H. & S.— Haage & Schmidt, Erfurt, Germany.
H. & W.— Howcroft & Watkins, London, England.
Hors.— F. H. Horsford, Charlotte, Vt.
J. & S.— Johnson & Stokes, Philadelphia, Pa.
Land.— David Landreth & Sons, Philadelphia, Pa.
Liv.— A. W. Livingston's Sons, Columbus, Ohio.
Maule — Wm. Henry Maule, Philadelphia, Pa.
Morrell — R. L. Morrell, Plymouth, Ind.
Pier.— M. F. Pierson, Seneca Castle, N. Y.
Raw.— W. W. Rawson & Co., Boston, Mass.
Rice — Jerome B. Rice, Cambridge, N. Y.
Sib.— Hiram Sibley & Co., Rochester, N. Y.
Sta.— Station.
Thor.— J. M. Thorburn & Co., New York, N. Y.
Till.— I. F. Tillinghast, La Plume, Pa.
Vick — James Vick, Rochester, N. Y.
Vil.— Vilmorin, Andrieux et Cie., Paris, France.
Wells — S. M. and D. Wells, Wethersfield, Conn.
Will.— J. S. Williston, Athens, Pa.

REPORT OF THE ASSISTANT HORTICULTURIST.*

INTRODUCTION.

In addition to the regular statistical work in the garden and orchard, a special study of the potato scab has been undertaken the past season. Brief notes are added upon other subjects as named below.

The topics are reported in the following order:

A study of the potato scab.
Notes on insects.
A fungus disease of the cucumber.
Notes on garden vegetables.
Notes on fruits.

POTATO SCAB.

A peculiar rusty scab-like appearance of the potato tuber is known as the "potato scab." It often extends deep into the body of the tuber, causing a considerable loss of substance. The edible qualities of the tubers thus affected are not injured, but their market value is greatly lessened.

A German authority† on plant diseases describes the potato scab as "consisting of a greatly increased formation of cork. The connecting wall-formed layer of cork cells which form the normal skin of the potato are thereby changed, so that the otherwise tabular cork cells become distended, round and bladder-like. This tissue lying beneath the skin produces new cork cells which force the older cells upward."

Various theories have been advanced concerning the cause of the scab, and not a little study has been given to the subject. At the present time little appears to be known concerning the true cause. Plowright‡ says: "As usually met with, each scab consists of a circumscribed cork formation of the rind of the tuber, as if each spot had at some earlier period of its existence been the seat of the injury. Most likely this precursory injury will be found due to a fungus of

*M. H. Beckwith.

†Soraur's Handbuch der Pflanzen Krankheiten, p. 84, ed. 1874.

‡C. B. Plowright, On Potato Diseases, Gardeners' Chron., Vol. 23, 1885, p. 60.

some sort, possibly to some mould, to prevent the penetration of which the tuber has developed a cork plate."

The scab is one of those phenomena concerning whose nature and cause the most diverse opinions prevail.

Several microscopical examinations of scabby tubers in various stages of the scab were made at this Station by Dr. J. C. Arthur, without detecting the presence of any fungus. I have been unable to find any reliable data indicating that the scab is caused by any known fungus. No remedy has been found that proves entirely successful in preventing the disease. The following experiments were attempted with a view of accumulating data to determine the cause and secure a remedy.

INFLUENCE OF SOIL.

In order to determine the influence of different kinds of soil in producing scab, medium-sized tubers that were smooth (or free from scab) were planted in eight-inch pots containing different soils, and placed in the greenhouse February 17. Four kinds of soil were used, two pots of each, muck, sand, garden soil and clay. After planting, all were treated as nearly alike as possible. The products of the tubers were removed from the pots May 31, after the tops were all dead, and carefully examined for scab. The per cent of scabby tubers and also the degree of scab were as follows:

	Whole No. of tubers.	Per cent scabby.	Degree of scab.
Muck	13	62	1
Sand	3	100	2
Garden soil	8	100	3
Clay	3	100	4

The muck proved the least favorable to the production of the scab. It was the only soil that produced any tubers entirely free from scab. The scabby tubers were affected in a less degree than those grown in the other soils. All the tubers grown in the other soils were more or less scabby, those grown in sand ranked next in degree of scabbiness, those in clay were the most affected. It is not safe to generalize from an experiment on so limited a scale, yet the result tends to show that soils of a loose, porous character produce tubers less affected by scab than those of a heavy, tenacious nature.

THE EFFECTS OF EXCESSIVE MOISTURE ON THE PRODUCTION OF SCAB.

On May 6, forty-five rows of potatoes, each row containing eight hills, were planted near the water-tank in the west garden in such a manner that four hills of each row could be irrigated and four remain

unirrigated. The seed used was the White Star variety, except the first row, which was a red-skinned seedling free from scab. A dry season made the conditions very favorable for this experiment. Irrigation was begun July 19, when the tubers had just commenced to form, by allowing a small stream of water to run during the hours from 6 P. M. to 7 A. M. between two of the four hills extending across the whole number of rows. This was continued until October 15, at which time each hill of potatoes was dug separately, each tuber examined for scab, and a record made of the whole number of tubers and the number of scabby tubers.

Twenty-two rows were planted with scabby tubers, and twenty-three with tubers entirely free from scab, in the following manner: First row, a red-skinned seedling free from scab, then two rows of scabby tubers of the White Star variety, next two rows with tubers of same variety free from scab, and so on alternately two rows scabby and two without scab. The tubers of each four rows thus planted were treated with a different substance intended as a preventive of the scab, which will be shown in the table that follows. The twenty-two rows on the south end of the planting were manured with stable manure before plowing the land.

TABLE A.

TREATMENT.	SCABBY SEED.				SMOOTH SEED.			
	IRRIGATED.		UNIRRIGATED.		IRRIGATED.		UNIRRIGATED.	
	Whole number of tubers.	Per ct. scabby.	Whole number of tubers.	Per ct. scabby.	Whole number of tubers.	Per ct. scabby.	Whole number of tubers.	Per ct. scabby.
UNMANURED.								
Untreated	....	....	....	....	19	84	21	47
Hyposulphite of soda	9	56	55	16	66	27	42	33
Sulphate of iron	80	22	116	22	77	12	81	18
Sulphate of copper	28	7	41	0	4	0	21	0
Mercury chloride	92	23	111	15	92	5	85	10
Salicylic acid	112	40	111	54	101	25	77	23
Carbolic acid	55	29	34	9	59	8	97	13
MANURED.								
Sulphur	100	49	123	41	125	56	139	19
Muriate of potash	83	83	104	33	65	80	84	20
Sulphate of potash	82	58	84	26	98	63	79	25
Air-slaked lime	104	89	105	22	89	80	76	50
Ground bone	78	87	77	90	59	85	105	86

Untreated.—Ordinary culture, smooth seed, 279 potatoes; 163 scabby, or 58.4 per cent.

Comparing the irrigated with the unirrigated portion, the following result is obtained:

	Total No. of tubers.	Per cent. scabby.
Irrigated	1,658	48
Unirrigated	1,868	31

The number of scabby tubers in the product of the irrigated portion exceeds the number of scabby tubers in that unirrigated by 17 per cent, which tends to indicate that excessive moisture favors the production of scab. This result coincides with the work of Nobbe.*

Comparing the product of the scabby seed of the irrigated and the unirrigated portions with that of the smooth seed of the irrigated and unirrigated portions resulted as follows:

Scabby Seed.

	Whole No. of tubers.	Per cent. scabby.
Irrigated	823	57
Unirrigated	961	32

Smooth Seed.

	Whole No. of tubers.	Per cent. scabby.
Irrigated	835	44
Unirrigated	907	29

It appears that there were 25 per cent more scabby tubers in the irrigated portion planted with scabby seed than in the unirrigated, and 15 per cent more scabby tubers in the irrigated portion planted with smooth seed than in the unirrigated; or 10 per cent more scabby tubers from the scabby than from the smooth seed.

The difference in the per cent of scabby tubers in the products of the smooth and the scabby seed does not appear striking, and does not in this case tend to disparage the use of scabby tubers for seed.

Comparing the manured and unmanured portions, the following data are obtained:

Unmanured.

	Whole No. of tubers.	Per cent. scabby.
Irrigated	775	22
Unirrigated	468	21

*Nobbe found in the water culture of the potato that, from the first formation of the tubers grown in water, very small warts were produced by excessive local growth of cork. These were not found in the tubers grown in the air. Soraur's Handbuch der Pflanzen Krankheiten, p. 84, ed. 1874.

Manured.

	Whole No. of tubers.	Per cent. scabby.
Irrigated	883	71
Unirrigated	996	30

Practically there was no difference in the percentage of scabby tubers between the irrigated and unirrigated portion that was not manured. In the manured portion the number of scabby tubers was 41 per cent greater in the irrigated than in the unirrigated.

THE RELATION BETWEEN COLOR OF SKIN AND THE LIABILITY TO SCAB.

To determine if any relation existed between the color of the skin of the potato tubers and the liability to scab, the yields of eleven hills each of forty-five different varieties tested in the garden were examined and counted with the following result:

	Whole No. of tubers.	Per cent. scabby.
Dark-skinned varieties	531	27
White-skinned varieties	1,076	43
Flesh-colored varieties	529	53

It appears that the dark-skinned varieties gave a smaller percentage of scabby tubers than the white varieties. Those having a flesh-colored skin appear to be most susceptible to the scab, the percentage of scabby tubers being greater than in either the white or dark-skinned varieties. Taking the average percentage of the scabby tubers produced by all the light-skinned varieties examined, forty-eight per cent were scabby. In this case the dark-skinned varieties were the least susceptible to scab.

TABLE B.

LIGHT VS. DARK-SKINNED VARIETIES.

	SEED.	Number of scabby tubers.	Number of smooth tubers.	Per cent scabby.
Row 1..	White Star free from scab	17	20	46.9
2..		20	21	49.7
3..		32	15	66.8
4..		14	11	56
5..		14	23	37.8
	Total number of tubers and average per cent scabby	97	90	51.4
Row 6..	Red-skinned seedling free from scab	1	18	5.2
7..		2	17	10.5
8..		3	7	30
9..		3	20	13.4
10..		10	11	47.6
	Total number of tubers and average per cent scabby	19	73	21.3

In the above table B, each row contained four hills planted with medium sized tubers entirely free from scab. The data obtained show that the product of the light-colored tubers contained nearly thirty per cent more scabby tubers than that of the dark-colored. Also that an increased percentage of scabby tubers accompanied an increase in the yield.

FUNGICIDES AS A PREVENTIVE OF SCAB.

The following experiments were made to determine the efficacy of various substances to prevent the potato scab. Tubers treated with hyposulphite of soda, sulphate of iron, mercury chloride and sulphur, were planted in eight-inch pots filled with potting soil and placed in the greenhouse February 17. The method of treatment and the results are given in the following table:

	Number of tubers.	Per cent scabby.	Degree of scab.
Hyposulphite of soda, 4 oz. to 1 pt. water	5	100	1
Sulphate of iron, 1 oz. to 1 pt. water	2	100	3
Mercury chloride, 1 part to 1,000 parts water	9	89	3
Mercury chloride, 1 part to 1,000 parts water*	1	100	3
Tubers moistened and rolled in sulphur	5	60	1

Eight medium-sized tubers were treated eighteen hours, two tubers with each substance as stated in the above table, and planted separately. The same number of tubers were allowed to remain in the solutions 48 hours, all of which failed to vegetate except those treated with mercury chloride. Sulphur and mercury chloride both appear in this case to have been slightly beneficial.

Another test of substances to prevent the scab was made on a larger scale in the garden. The different substances used and the method of treatment were as follows:

Hyposulphite of soda, 4 oz. dissolved in 1 qt. of water.
Sulphate of iron, 4 oz. dissolved in 1 qt. of water.
Sulphate of copper, 4 oz. dissolved in 1 qt. of water.
Mercury chloride, 1 part to 1,000 parts of water.
Salicylic acid, a saturated solution.
Carbolic acid, 1 part to 100 parts of water.
Powdered sulphur, 1 tablespoonful in each hill.
Muriate of potash, ½ oz. in each hill.
Sulphate of potash, ½ oz. in each hill.
Air-slacked lime, 1 tablespoonful in each hill.
Ground bone, 1 tablespoonful in each hill.

The data of this experiment are given in table A on page 309. In this test all the substances used appeared more or less beneficial, except the ground bone, which produced the greatest per cent of scabby tubers. The percentage of scabby tubers in nearly all other rows was less than in the untreated row. The sulphate of copper appeared the most efficacious in preventing the scab. Three of the four rows treated produced tubers entirely free from scab; the fourth row produced only two scabby tubers, or seven per cent of the whole number of tubers. None of the other rows were entirely free from scab.

* Treated 48 hours.

SCABBY *vs.* SMOOTH SEED TUBERS.

It is quite important to know whether the product will be less affected by scab when tubers free from scab are planted than when scabby tubers are used.

Duplicate plantings, as given in the following table, were made in eight-inch pots, filled with potting soil and placed in the green-house February 19. All were treated as nearly alike as possible.

TABLE — SEED.

SEED.	Number of tubers scabby.	No. of tubers free from scab.	Per cent scabby	Degree of scab.
Tubers free from scab	6	0	100	2
Duplicate	1	0	100	1
Tuber free from scab planted with scabby tuber	4	0	100	1
Duplicate	0	1	0	0
Tuber free from scab watered with water in which scabby tubers were soaked	2	0	100	3
Duplicate	3	1	75	1

In this experiment nothing appears to have been gained by using tubers free from scab. In the products of both of the tubers free from scab, every tuber was more or less scabby. In the two plantings of a smooth and scabby tuber in the same pot, the product of one was four tubers, all scabby, and of the other one tuber free from scab. The plantings of smooth tubers watered with the liquid in which scabby tubers had been soaked for 48 hours, in each case produced some scabby tubers and one tuber free from scab.

Comparing the yield of smooth and scabby tubers, as given in the table A, page 309, we obtain the following data:

Scabby Seed.

	Whole No. of tubers.	Per cent scabby.
Irrigated	823	57
Unirrigated	961	32

Smooth Seed.

	Whole No. of tubers.	Per cent scabby.
Irrigated	835	44
Unirrigated	907	29

This shows 25 per cent more scabby tubers in the irrigated portion planted with scabby seed than in the unirrigated, and 15 per cent more scabby tubers in the irrigated portion planted with smooth seed than in the unirrigated; or 10 per cent more scabby tubers from the scabby than from smooth seed. The difference is not sufficiently striking to justify the conclusion that any gain results from planting tubers free from scab.

The data obtained from the foregoing experiments indicate that:

The scab was not primarily caused by a fungus.

It was not due to the work of insects.

In nearly every instance an increased yield was accompanied by an increased percentage of scabby tubers.

Any marked change in the rapidity of growth, either an increase or a decrease, tends to an increased production of scab.

A continuous growth from the time of first vegetation until the tubers are fully matured appears to be the condition least favorable to the production of scabby tubers.

QUINCE CURCULIO.

Specimens of fruit that were injured by an insect were received from the quince orchard of Messrs. Maxwell & Scoon. The larva in the fruit was identified as that of the quince curculio, *Conotrachelus cratægi*, Walsh. The identification was verified by Dr. Lintner, from specimens of the larvæ sent to him.

The quince crop in this section has been much injured by the ravages of this insect for the past two seasons. Many of the insects may be destroyed in the spring by the jarring method that has been so successfully employed for the plum curculio.

"The insect bears a family resemblance to the plum-curculio, being larger, with a longer beak or snout, and a body which is broadest across the base of the wing covers. Instead of the crescent cut characteristic of the plum curculio, it simply makes a puncture for the reception of its eggs. After about a month's feeding the larvæ leave the fruit and burrow into the earth, where they remain unchanged from the larval state until early in May, when they transform to pupæ and shortly after that to the perfect insect."*

The cultivation of the orchard, late in autumn and early in spring, before the larvæ transform into the perfect insects, will undoubtedly destroy great numbers of the larvæ and greatly lessen the ravages of the insects.

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*Second annual report on the Injurious and Other Insects of N. Y., by J. A. Lintner, p. 11.

THRIPS IN STRAWBERRY BLOSSOMS.

On June 27, numerous minute insects were found in strawberry blossoms, which appeared to be feeding upon the pollen. Specimens of the blossoms containing the insects were sent to Dr. J. A. Lintner, State Entomologist, who identified the insects as belonging to the family of *Thripidæ*. It was the first account he had received of their appearance in this State. The strawberry crop in Illinois was greatly injured by their ravages in 1886, but I could not perceive that they caused any injury to our crop.

No remedy was tried, as the insects disappeared as suddenly as they came.

A FUNGUS DISEASE OF THE CUCUMBER.

The green fruits of the cucumber growing in the Station garden were found to have received injuries that rendered them unfit for pickling. The injury consisted of numerous small, round, shallow depressions, from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in diameter, from which at first a gummy-like substance exuded. Afterwards this substance appeared to dry up, leaving the depression covered with a thin film of black substance.

These injuries appeared as though they had been caused by an insect, but a microscopical examination by Dr. J. C. Arthur revealed the fact that the trouble was really due to a fungus allied to the Fusicladium and Cladosporium.

"The spots are caused by the growth of a fungus, a species of Cladosporium, very similar in microscopic characters to Cladosporium herbarum, which grows on all kinds of dead and dying vegetation. But as the growth in this case is upon otherwise perfectly healthy fruit, it may be doubted if it is that species. The fungus produces on the surface of the spots great numbers of two-celled spores which germinate in a few hours after being placed in water. The rapidity with which the fungus can be disseminated indicates a probability of its becoming as general and formidable a disease as tomato rot is at the present time."—J. C. ARTHUR.

NOTES ON GARDEN VEGETABLES.

BEET.

In testing the varieties of beets and mangels, those named in the following tables were planted April 22, in rows twelve feet long and forty-two inches apart, one row to each name. The land devoted to testing vegetables was liberally manured with well-rotted manure, and plowed in the fall of 1886. The ground was kept free from weeds and the plants in the rows thinned to about six inches apart.

The explanation of abbreviations used is placed at the end of the report of the horticulturist.

The date when the beet roots in each row were of edible size, the number and average weight of the roots harvested, were as follows :

BEET.	Seed from	Of edible size.	Days from planting.	Number of roots.	Average weight in ounces at harvest.
Bastian's Blood Turnip	Hen...	June 15	54	28	24
Bastian's Blood Turnip	Thor..	" 15	54	25	20
Bastian's Extra Early Turnip	Hen ..	" 15	54	26	23
Bastian's Half Long Blood	Hen ..	" 18	57	23	37
Crosby's Early Egyptian	Greg..	" 12	51	34	9
Dewing's Early Blood Turnip	Greg..	" 13	52	30	20
Dewing's Extra Early Turnip	Thor..	" 13	52	37	24
Dewing's Improved Blood Turnip	Hen...	" 15	54	31	19
Dracœna Leaf (Fr., rouge à feuillage ornamentale)	Vil....	" 18	57	20	14
Early Bassano	Thor .	" 12	51	26	24
Early Blood Turnip	Thor .	" 14	53	28	27
Early Flat Bassano	Hen ..	" 12	51	33	27
Early Yellow Turnip	Hen ..	" 12	51	31	18
Early Yellow Turnip	Thor .	" 15	54	34	22
Eclipse	Greg..	" 12	51	32	21
Eclipse	Thor .	" 12	51	33	23
Egyptian	Greg..	" 12	51	41	15
Extra Early Egyptian Turnip	Thor .	" 12	51	41	22
Henderson's Pine Apple	Hen ..	" 18	57	30	37
Improved Long Smooth Blood	Thor .	" 16	55	29	24
Long Smooth Blood	Thor..	" 16	55	23	40
Long Smooth Blood Red	Hen ..	" 16	55	26	32
Long Smooth Dark Blood	Greg..	" 16	55	30	33
New Early Red Flat Turin	Thor..	" 15	54	27	25
Pine Apple	Hen ..	" 18	57	40	13
Round Yellow Turnip	Greg..	" 14	53	33	16

MANGEL.	Seed from	Number of roots.	Average weight in ounces at harvest.
Carter's Orange Globe	Greg....	32	31
Golden Ovoid	Greg....	30	39
Golden Tankard	Greg....	19	43
Henderson's Champion Yellow Globe	Hen	30	38
Henderson's Colossal	Hen	34	31
Knauer's Improved Imperial	Greg....	21	35
Norbitan Giant	Greg....	32	30
Red Giant Ovoid	Greg....	24	30
Red Tankard	Greg....	26	28
Webb's New Kinver Yellow Globe	Greg....	35	40

CARROT.

Seeds of the following list of carrots were planted April 14, in the same manner as the beet. The plants in the rows were not thinned until late in the season, in consequence of which the roots did not attain a large size.

The same data are given in the table as for the beets.

CARROT.	Seed from	Of edible size.	Days from planting.	Number of roots.	Average weight per root in ozs. at harvest.
Altringham	Hen ..	July 18	95	30	7
Carentan	Thor .	" 18	95	131	3
Chantenay Half Long Scarlet	Greg..	" 18	95	216	2
Chantenay Stump Rooted	Vick..	" 16	93	130	3
Chantenay Half Long Scarlet, stump rooted. (Fr., rouge demi longue de Chantenay)	Vil....	" 18	95	62	5
Danvers	Greg..	" 17	94	143	2
Danvers	Thor ..	" 17	94	149	2
Early French Forcing	Hen ..	" 15	92	60	3
Early Half Long Pointed	Hen ..	" 16	93	128	2
Early Horn	Thor .	" 15	92	77	3
Early Scarlet Horn	Greg..	" 15	92	104	3
Early Very Short Scarlet	Greg..	" 15	92	54	4
Extra Early Forcing	Thor .	" 15	92	54	3
Guerande	Greg..	" 15	92	55	6
Half Long Red Pointed	Thor .	" 16	93	89	3
Half Long Red (stump rooted)	Hen ..	" 18	95	142	2
Half Long Stump Rooted	Thor .	" 16	93	110	2
Half Long Stump Rooted Nantes	Thor .	" 17	94	203	1
Henderson's Intermediate Red	Hen ..	" 20	97	161	2
Improved Long Orange	Greg..	" 23	100	197	2
Long Orange	Greg..	" 23	100	149	2
Long Orange	Thor .	" 23	100	168	2
Long White	Greg..	" 24	101	47	6
New Guerande	Thor .	" 18	95	54	2
New Half Long Luc	Thor .	" 16	93	44	5
White Belgian	Thor .	" 23	100	49	7

ONION.

In the following list of onions the seeds were planted April 14, two rows of each name, twelve feet long, the rows twenty-one inches apart. The bulbs of one row of each name were thinned when they began to crowd, to one inch apart; the other row was left without thinning. The number of bulbs, weight per row and per hundred bulbs are given in the following table:

TABLE—ONIONS—(*Continued*).

ONION.	Seed from	First ripe.	Days from planting.	THINNED ROW.			UNTHINNED ROW.		
				No. of bulbs.	Wt. per row in ounces.	Wt. in ounces, calculated per 100 bulbs.	No. of bulbs.	Wt. per row in ounces.	Wt. in ounces calculated per 100 bulbs.
Bright Red Mezieres (Fr., rouge vif de Mézierês)	Vil.	Aug. 4	113	57	247	433	78	275	340
Early Flat Red	Greg.	July 25	103	80	176	220	92	174	189
Early Red Flat	Thor.	July 25	103	66	154	233	145	203	140
Early Red Globe	Greg.	July 25	103	78	157	201	142	233	109
Early Round Yellow Danvers	Greg.	July 13	91	91	98	108	214	190	89
Early Yellow Cracker	Greg.	July 13	91	45	88	186	203	167	82
Extra Early Red	Hen	July 13	91	74	121	164	181	187	103
Flat Madeira	Thor.	Aug. 3	112	80	240	300	184	398	216
Giant Globe	D. of A.	July 27	105	52	105	202	101	157	155
Giant Red Flat Italian Tripoli	Hen	July 13	191	72	56	78	220	123	56
Giant Rocco	Thor.	Aug. 4	113	65	374	575	97	407	420
Giant White Garganus	Thor.	Aug. 6	115	86	236	262	179	310	173
Landreth's Golden Ball	Land.	Aug. 4	113	57	186	326	139	241	173
Large Brown St. Laurent (Fr., jaune brun de St. Laurent)	Vil.	Aug. 6	116	....	....	....	127	252	198
Large Red	Thor.	Aug. 4	113	67	121	175	142	167	118
Large White Italian Tripoli	Hen	July 11	89	81	43	53	257	96	37
Large White Tripoli	Thor.	July 27	105	54	47	87	77	260	338
Mammoth Tripoli	Greg.	July 28	106	72	77	107	96	136	141
Nasbey's Mammoth	Greg.	Aug. 4	113	79	169	214	144	271	190
New Queen	Greg.	July 9	87	62	24	39	98	26	27
Pale red Bermuda	Thor.	July 28	106	89	138	156	193	222	115
Pear-Shaped Early Yellow (Fr., pyriforme jaune hâtif)	Vil.	July 13	91	85	65	76	217	134	62
Philadelphia White	Greg.	July 28	106	66	65	98	132	109	83
Queen	Thor.	July 9	87	54	26	48	50	24	48
Red Pearl	Thor.	July 27	105	70	92	131	118	108	91
Round Yellow Danvers	Hen	July 28	106	72	88	122	244	150	61

TABLE — ONIONS — (*Continued*).

ONION.	Seed from	First ripe.	Days from planting.	THINNED ROW.			UNTHINNED ROW.		
				No. of bulbs.	Wt. per row in ounces.	Wt. in ounces calculated per 100 bulbs.	No. of bulbs.	Wt. per row in ounces.	Wt. in ounces calculated per 100 bulbs.
Russian Yellow Hard Improved (Fr., jaune chair de Russie acclimaté)	Vil.	Aug. 5	114	95	90	105	129	216	167
Southport Late Red Globe	Greg.	Aug. 4	113	94	155	166	134	189	141
Southport White Globe	Greg.	Aug. 4	113	82	166	202	....	....	....
Teneriffe or Early Bermuda	Greg.	July 9	87	34	14	41	32	21	66
White Flat Italian	Greg.	Aug. 10	119	95	193	203	110	210	191
White Flat Maggiajola	Thor.	July 11	89	101	47	46	200	88	45
White Globe	Thor.	July 28	106	53	188	354	71	262	383
White Pearl	Greg.	July 9	87	71	36	51	143	60	42
White Portugal	Greg.	July 28	106	79	92	116	126	124	98
White Portugal	Thor.	Aug. 4	113	84	135	161	163	212	130
Yellow Danvers	Thor.	July 26	104	80	83	96	164	145	88
Yellow Dutch or Strasburgh	Hen	July 26	104	86	86	100	280	178	64
Yellow Globe	Thor.	July 26	104	112	103	92	68	74	19
Yellow Globe Danvers	Thor.	July 26	104	74	149	201	184	266	145
Yellow Globe Danvers (Cal. seed)	Till.	July 26	104	51	137	269	54	138	256
Yellow Globe Danvers (N. J. seed)	Till.	July 26	104	10	19	190	15	35	233
Yellow Globe Danvers (Wash. Ter'y seed)	Till.	July 26	104	60	79	131	60	184	115
Yellow Strasburg or Large Yellow	Greg.	July 26	104	73	186	118	111	156	141

In this test the unthinned rows in nearly every case produced the greatest weight of bulbs, and the thinned rows the largest bulbs.

MELON.

The following list of melons were planted May 9 on inverted sods in the cold frame and were transplanted to the garden May 25 in rows twelve feet long and seven feet apart. The transplanting did not appear to retard the growth of the plants.

The data noted are as follows:

MUSKMELON.	Seed from	First bloom.	Days from planting.	First ripe fruit.	Days from planting.
Bellegarde Canteloup (Fr., de Bellegarde)	Vil.	July 8	60	Sept. 6	120
Burpee's Champion Market	Greg.	June 21	43	Aug. 26	109
Burpee's Champion Market	Sib.	" 20	42	" 26	109
Creole or New Orleans Market	Sib.	" 18	40	" 18	101
Extra Early Canteloupe	Greg.	" 17	39	" 6	89
Golden Gem	Sib.	" 16	38	" 22	105
Golden Netted Gem	Thor.	" 17	39	" 11	95
Jenny Lind	Thor.	" 17	39	" 12	94
Miller's Cream	Greg.	" 20	42	" 27	116
New Early Hackensack	Hen	" 20	42	" 11	94
Prolific Nutmeg	Vick.	" 20	42	" 23	100
Reedland Giant	Land.	" 21	43	" 16	99

WATERMELON.	Seed from	First bloom.	Days from planting.	First ripe fruit.	Days from planting.
Florida Favorite	Greg.	July 5	57	Aug. 13	96
Florida Favorite	Sib.	" 5	57	" 14	97
Florida Favorite	Vick.	" 5	57	" 14	97
Kolb's Gem	Hen	" 2	54	" 16	99
Landreth's Boss	Land.	" 2	54	" 18	101
Mammoth Ironclad	Sib.	" 8	60	" 23	106
Oemler's Triumph	Greg.	" 1	53	" 13	96
Oemler's Triumph	Thor.	" 1	53	" 15	98
Pride of Georgia	Sib.	" 5	57	" 15	98
Seikon	Vil.	" 1	53	" 22	105
Stokes' Extra Early	Greg.	" 2	54	" 17	100
Volga	Hen	" 1	53	" 20	103

The Extra Early Canteloupe was the earliest to ripen. It matured the first fruit in 89 days from date of planting.

The latest was the Bellegrade Canteloup, which ripened its first fruit 120 days from date of planting.

The Creole or New Orleans Market, Reedland Giant and the New Early Hackensack produced very large fruits.

One specimen of the Creole or New Orleans Market melon was tested which weighed 9 lbs. 2 oz.; flesh yellowish green, very thick and quite firm, rather coarse texture, flavor fair to good, not rich.

Reedland Giant resembles the Creole except in shape, which is oblong instead of round.

CUCUMBER.

The following list of cucumbers was planted May 9, in the same manner as the melons:

CUCUMBERS.	Seed from	First bloom.	Of pickle size.	First ripe fruit.
Bismarck	Greg.	June 20	July 9	Sept. 21
Boston Pickling	Thor.	" 16	" 2	Aug. 2
Early Cluster	Greg.	" 16	" 2	" 2
Early Green Cluster	Thor.	" 16	" 1	July 23
Early Russian	Thor.	" 16	" 2	Aug. 1
Early Short Green	Thor.	" 17	" 1	July 19
Early White Japan	Thor.	" 27	" 9	Aug. 9
Early White Spined	Thor.	" 21	" 6	" 6
Early Yellow Dutch (Fr., jaune hâtif de Hollande)	Vil.	" 20	" 4	" 4
Extra Early Green Prolific	Hen.	" 16	" 2	July 23
Extra Long Green Smooth	Greg.	" 20	" 5	Aug. 6
Extra Long White Spined	Thor.	" 20	" 5	Sept. 21
Green Prolific Pickling	Thor.	" 16	June 24	July 21
Improved Early White Spined	Thor.	" 20	July 12	Sept. 21
Improved Long Green Prickly	Greg.	" 24	" 15	Aug. 30
Jersey Pickle	Land	" 20	" 2	July 29
Landreth's First Early	Land	" 20	" 5	Aug. 5
Landreth's White Slicing	Land	" 20	" 8	July 30
Large White Bonneuil	Greg.	" 23	" 5	Aug. 1
Long Grecian	Thor.	" 23	" 6	July 29
Long Green	Thor.	" 20	" 7	Aug. 5
Long Green Smooth from Athens	Greg.	" 21	" 5	" 30
Long Green Turkey	Thor.	" 21	" 2	" 4
Meaux Green Pickling (Fr., à cornichons fine de Meaux)	Vil.	" 20	" 5	" 4
Nichols' Medium Green	Thor.	" 20	" 4	" 4
Peerless	Thor.	" 20	" 6	" 4
Russian Netted	Greg.	" 16	" 4	July 30
Russian Netted (Fr., brodé de Russia)	Vil.	" 18	" 4	" 30
Short French Pickling	Greg.	" 22	" 7	" 7
Short Prolific Pickle	Land.	" 16	" 1	" 30
Small Early Russian (Fr., de Russie)	Vil.	" 16	" 4	" 19
Small Gherkin	Thor.	July 6	" 18	.....
Snake	Greg.	June 24	.....	Sept. 13
Tailby's Hybrid	Thor.	" 21	July 8	" 19
West India Gherkin	Greg.	July 8	" 18	.....
White German	Greg.	June 21	" 7	Aug. 6

SQUASH AND PUMPKIN.

The varieties of squash and pumpkin were planted May 11, two hills of each variety in rows fourteen feet apart, the hills twelve feet apart.

SQUASH.	Seed from	First bloom.	Days from planting.	First fruit ripe.	Days from planting.
Bay State	Raw..	July 2	52	Sept. 24	136
Boston Marrow	Thor..	" 5	55	" 14	126
Brazilian Sugar	Thor..	" 1	51	" 7	119
Butman	Greg..	" 6	56	" 24	136
Butman	Thor..	" 16	66	" 24	136
Canada Crookneck	Thor..	" 5	55	" 20	132
Dunlap's Early Marrow	Greg..	June 28	48	Aug. 20	101
Early Golden Bush	Thor..	" 27	47	" 15	96
Early White Scallop Bush	Thor..	" 29	49	" 15	96
Essex Hybrid or Hardshell Turban	Vick..	July 2	52	Sept. 14	126
Extra Early Orange Marrow	Thor..	June 24	44	Aug. 20	101
Green Striped Bergen	Thor..	July 5	55	Sept 1	113
Hubbard	Thor..	" 6	56	" 24	136
Landreth's White Turban	Land..	" 18	68	" 21	133
Large Winter Crookneck	Greg..	" 13	63	" 7	119
Little Cocoanut	Thor..	" 20	70	" 7	119
Long Green Summer Crookneck	Land..	" 21	71	" 16	128
Low's Premium Hybrid	Thor..	" 13	63	" 13	125
Mammoth Chili	Thor..	" 11	61	" 24	136
New Egg Plant	Hen ..	" 9	59	" 15	127
New French Olive	Thor..	Aug. 5	86	"	....
New Marblehead	Thor..	July 11	61	" 17	129
New Pineapple	Thor..	" 11	61	" 10	122
New Prolific Sugar	Hen ..	" 9	59	" 7	119
Ohio	Thor..	Aug. 5	86	" 15	127
Perfect Gem	Thor..	" 6	87	" 7	119
Red China	Thor..	" 3	84	" 7	119
Summer Crookneck	Thor..	July 11	61	Aug. 20	101
Turban	Thor..	" 9	59	Sept. 14	126
Turban or Turk's Cap	Vick...	Aug. 5	86	" 14	126
Vegetable Marrow	Thor..	July 11	61	" 7	119
Yokohama (Fr., de Yokohama)	Vil....	Aug. 8	89	" 21	133

PUMPKIN.	Seed from	First bloom.	Days from planting.	First fruits ripe.	Days from planting.
Black Negro	Thor	July 5	55	Sept. 14	126
Brazilian Sugar	Greg.	" 2	52	" 7	119
Bright Red Etampes (Fr., rouge vif, gros d'Etampes)	Vil.	" 6	56	" 18	130
Bright Red Etampes	Thor	" 9	59	" 18	130
Connecticut Field	Thor	June 30	50	Aug. 22	103
Cashaw	Land	July 7	57	Sept. 18	130
Cushaw	Thor	" 2	52	" 18	130
Early Sugar	Thor	June 30	50	Aug. 20	101
Green Spanish (Fr., vert d'Espagne)	Vil.	July 2	52	Sept. 15	127
Grey Boulogne (Fr., Gris de Boulogne)	Vil.	Aug. 5	86	" 15	127
Improved Mammoth	Thor	July 2	52	" 18	130
Jumbo	Hen	" 1	51	Aug. 23	104
Large Cheese	Thor	" 8	58	" 23	104
Large Field	Greg.	June 29	49	" 22	103
Large Tours, or Mammoth	Hen	July 1	51	Sept. 7	119
Large Tours (Fr., de Touraine)	Vil.	June 30	50	" 7	119
Large Yellow Mammoth (Fr., jaune gros)	Vil.	July 11	61	" 7	119
Mammoth	Sib.	" 6	56	.....	.....
Mammoth Red Etampes	Greg.	" 25	75	Sept. 10	122
Michigan Mammoth	Greg.	" 2	52	Aug. 22	103
Negro, or Nantucket	Greg.	June 30	50	Sept. 7	119
Possum Nose	Greg.	July 27	77	" 17	129
Tree	Greg.	" 12	62	" 15	127

SPINACH.

Seeds from twelve differently named packages of spinach were planted, April 15, in rows twelve feet long and three and one-half feet apart. The following data were noted :

SPINACH.	Seed from	First bloom.	Days from planting.	First ripe seed.	Days from planting.
Bloomsdale	Greg..	May 31	46	June 27	73
Curled Leaved Savoy or Bloomsdale	Thor..	" 31	46	" 27	73
Extra Large Round Leaved	Greg..	" 31	46	" 27	73
Henderson's Norfolk Savoy Leaved	Hen ..	June 4	50	July 2	78
Large Round Leaf Viroflay	Hen ..	" 4	50	June 28	74
Large Round Viroflay	Thor..	" 4	50	July 2	78
New Long Standing	Thor..	" 4	50	" 2	78
New Thick Leaved	Hen ..	" 4	50	" 1	77
New Zealand	Thor..	Sept. 18	156	.....	.....
Prickly	Thor..	June 1	47	June 28	74
Round Flanders	Thor..	May 31	46	July 1	77
Round Leaved	Thor..	" 31	46	" 1	77

The Bloomsdale, Greg.; Curled-Leaved or Bloomsdale, Thor.; Extra Large Round-Leaved, Greg., and Henderson's Norfolk Savoy-Leaved, Hen., appeared to be identical.

The Large Round-Leaf Viroflay, Hen.; Large Round Viroflay, Thor.; New Long-Standing, Thor., and New Thick-Leaved, Hen., appeared to be the same.

I could detect no difference in the Round Flanders, Thor., and Round-Leaved, Thor.

The New Zealand, a distinct species, is entirely different from the other varieties in its habit of growth. It remained in edible condition the entire summer. At this date (October 25) it is still in fine condition for eating.

LETTUCE.

Seeds of the following list of lettuces were planted April 23:

LETTUCE.	Seed from.	Of edible size in —— days.	Com. to form flower stalk in —— days.	Days fit for table use.	First bloom in —— days.	First seeds ripe in —— days.
Burpee's Silver Ball	Sta.	33	74	41	83	107
Buttercup	Greg.	31	77	46	106	124
Buttercup	Vick.	31	77	46	106	124
Curled leaf	Dam	38	59	21	87	96
Defiance Summer	Hen	31	....	....	....	....
Dippe's Emperor	Sta.	39	53	14	70	87
Egg Small Early Solid	Ben	31	57	26	85	96
Emperor Frame Cabbage	Greg.	39	53	14	74	94
Finest Moss Curled	Dam	39	47	8	67	85
Forcing Emperor Earliest Yellow	Ben	39	50	11	67	87
Green Fat	Will	36	70	34	88	109
Hanson	Greg.	34	78	44	92	106
Imperial Select Cabbage	Land	29	57	28	74	95
Improved Hanson	Thor	31	78	47	91	106
Large Brown Coblentz	Dam	31	72	41	88	104
Large Egg Frame	Dam	32	68	36	90	103
Perpignan	Dam	31	72	41	91	105
Prize Market	Sib.	31	74	43	91	106
Sibley's Genesee	Sib.	29	77	48	104	115

The Buttercup lettuce was entirely different from any variety heretofore grown at the Station.

Sibley's Genesee was identical with the Neapolitan.

There was but one plant of the Defiance Summer, Hen.; consequently the data concerning this variety are necessarily incomplete.

CABBAGE.

In the following list of cabbage the products from the large and small seed of twelve of the varieties are given, together with other data, in the following table:

TABLE — CABBAGE.

CABBAGE.	LARGE SEED.							SMALL SEED.					
	Seed from	First head formed.	Days from planting.	Number of plants.	Number of heads form'd	Av. diameter in inches.	Av. weight of heads in ozs.	First head formed.	Days from planting.	Number of plants.	Number of heads form'd	Av. diameter in inches.	Av. weight in ounces.
Acme Drumhead Savoy	Alb.	Oct. 20	155	9	6	$8\frac{2}{3}$	61	Oct. 20	155	11	10	7 4-5	57
Acme Flat Dutch	Alb.	Oct. 5	140	11	9	$9\frac{1}{2}$	89	Oct. 5	140	11	10	$8\frac{1}{2}$	66
Acme Red Drumhead	Alb.	Oct. 15	150	10	4	$5\frac{1}{2}$	33	Oct. 15	150	11	4	$5\frac{1}{2}$	33
Early Drumhead	Liv.	Sept. 21	126	12	11	8	88	Sept. 26	131	9	8	$8\frac{3}{4}$	96
Early Mammoth Bulgarian	Thor.	Oct. 5	140	12	12	8	70	Oct. 5	140	12	12	$8\frac{3}{4}$	69
Early Paris Market	Thor.	Sept. 23	128	11	11	$7\frac{1}{2}$	72	.....	....	..	..	....	...
Express (extra early)	Vil.	Sept. 3	108	12	12	$6\frac{1}{2}$	63	Sept. 8	113	11	11	6	50
Extra Early Midsummer St. Jean (Fr., de Milan très hâtif de la St. Jean)	Vil.	Sept. 20	125	10	10	7 2-5	57	.....	....	1	..	....	...
Green Mountain	Alb.	Oct. 8	143	11	9	9 4-9	71	Oct. 8	143	10	6	9	83
Housman's Flat Dutch	Alex.	Oct. 3	138	12	7	9	78	Oct. 6	171	11	5	9	78
Montreal Market	Alex.	Oct. 1	136	12	8	9	80	.....	....	..	..	....	...
Reedland Early Drumhead	Land.	Sept. 20	125	12	12	$9\frac{1}{3}$	103	Sept. 20	125	12	12	9	99
Renne's Early (Fr., hâtif de Renne's)	Vil.	Sept. 20	125	12	9	7	61	Sept. 20	125	11	8	$6\frac{3}{8}$	54
Stein's Early Flat Dutch	Alb.	Oct. 1	136	12	10	$9\frac{1}{2}$	85	Oct. 1	136	12	10	9	81
Strang's Very Early	Alb.	Sept. 21	126	12	10	9 7-10	97	Sept. 28	133	10	10	9	93
Winter	Liv.	Oct. 18	153	6	3	6	33	.....	....	..	..	....	...

In nearly every planting, the average diameter and average weight of the heads from large seed were greater than from the small seed.

TOMATO.

Seeds of the following list of tomatoes were planted in boxes and placed in the greenhouse March 11; when of proper size the plants were potted in three-inch pots, from which four plants of each name were transplanted to the garden May 20, in rows seven feet apart, the plants three feet apart in the row:

TOMATO.

TOMATO.	Seed from	First fruit ripe.	Days from planting.	Ten fruits ripe.	Days from planting.
Acme	Thor..	July 25	136	Aug. 2	144
Alpha	Thor.	" 16	127	July 26	137
Arlington	Greg..	Aug. 2	144	Aug. 5	147
Autocrat	Sib...	July 22	133	" 6	148
Bermuda (Extra Early)	Land..	" 26	137	" 1	143
Boston Market	Greg..	" 26	137	" 1	143
Bunker Hill	Bliss..	" 26	137	" 2	144
Cardinal	Thor..	" 25	136	" 7	149
Conqueror	Thor..	" 18	129	July 23	134
Cook's Favorite	Land..	" 23	134	" 29	140
Criterion	Greg..	" 28	139	Aug. 4	146
Dwarf Orangefield	Sib...	Aug. 10	174	" 28	192
Early Advance	Thor..	July 26	137	July 28	139
Early Jersey (Extra Early)	Land..	" 23	134	Aug. 5	147
Early King Humbert	Thor..	" 23	134	July 26	137
Early Richmond	Land..	" 24	135	Aug. 2	144
Early Smooth Red	Vick..	" 26	137	July 28	139
Essex Hybrid	Thor..	" 23	134	" 27	138
Essex Round Red Smooth	Greg..	" 21	132	" 27	138
Extra Early or Cluster	Land..	" 25	136	" 31	142
Faultless	Greg..	" 26	137	" 29	140
Fejee Improved	Greg..	" 25	136	Aug. 6	148
Fulton Market	Greg..	" 22	133	July 27	138
Gen. Grant	Vick..	" 18	129	Aug. 1	143
Golden Queen (Fr., jaune grosse lisse)	Vil....	Aug. 2	144	" 11	153
Golden Queen	Thor..	July 29	140	" 2	144
Golden Trophy	Land..	" 30	141	" 3	145
Green Gage	Thor..	" 31	142	" 3	145
Hathaway's Excelsior	Vick..	" 18	129	" 2	144
Hovey	Thor..	Aug. 1	143	" 10	152
Hubbard's Curled Leaf	Thor..	July 21	132	July 27	138
Hundred Day	Thor..	" 18	129	" 24	135
Improved Large Yellow	Thor..	Aug. 9	151	Aug. 15	157
Improved Mayflower	D. of A.	July 22	133	" 4	146
Improved Queen	Thor..	" 26	137	" 4	146
Island Beauty	Hen...	" 27	138	" 2	144
Ivory Ball	Land..	" 28	139	" 2	144
Large Round Red Smooth	Greg..	" 29	140	" 3	145
Large Smooth Red	Thor..	" 29	140	" 6	148
Large Yellow	Thor..	" 26	137	" 2	144
Little Gem	Greg..	" 16	127	July 19	124
Livingston's Beauty	Liv...	" 23	134	Aug. 13	155
" "	Thor..	" 23	134	" 3	145
Livingston's Favorite	Liv...	" 25	136	" 3	145
" "	Thor..	" 24	135	" 2	144
Livingston's Perfection	Liv...	" 23	134	" 2	144
" "	Thor..	" 27	138	" 2	144
"Maule's $1,600 Strain"	Maule	Aug. 13	121	Sept. 1	139
Mayflower Sport	Bliss..	" 1	143	Aug. 7	149
Mayflower	Vick..	July 25	136	" 3	145
Mikado	Thor..	Aug. 3	145	" 9	151
New Bronzed-Leaved	Greg..	July 23	134	" 6	148
New Currant	Thor..	" 8	119	July 10	121
New Jersey	Thor..	" 27	138	Aug. 15	157
New Paragon	Thor..	" 28	139	" 12	154

TABLE — TOMATO — *(Continued).*

TOMATO.	Seed from	First fruit ripe.	Days from planting.	Ten fruits ripe.	Days from planting.
New Red Apple	Greg..	July 23	134	Aug. 4	146
New White Apple	Thor..	" 30	141	" 10	152
Optimus	Thor..	" 27	138	" 6	148
Peach	Land..	Aug. 13	155	" 18	160
Pear-shaped	Thor..	July 21	132	July 30	141
Potato Leaf	Sta ...	" 27	138	Aug. 10	152
President Garfield	Sib....	Aug. 3	145	" 13	155
Queen	Hen ..	July 27	138	" 7	149
Rawson's Puritan	Raw ..	" 22	133	" 4	146
Red Cherry	Thor..	" 11	122	July 14	125
Rochester	Sib....	" 29	140	Aug. 15	157
Rochester Favorite	Greg..	Aug. 5	147	" 15	157
Station	Sta ...	July 6	117	July 16	127
Tilden's New	Greg..	" 23	134	July 31	142
Trophy	Thor..	Aug. 3	145	Aug. 12	154
Turner's Hybrid	Greg..	" 17	159	" 27	169
Yellow Cherry	Thor..	July 6	117	July 12	123
Yellow Fig	Greg..	" 23	134	" 30	141
Yellow Plum	Thor..	" 23	134	" 28	139
Yellow Victor	Greg..	" 26	137	Aug. 1	143

In the above table the Dwarf Orangefield, and Maule's $1,600 Strain, were planted March 31 and April 14, respectively.

The Station variety matured the first fruit, and also the first ten fruits of any, except the Cherry and Currant, the fruit of which are too small for table use.

PEA.

The following list of peas was planted April 15 in rows twelve feet long, the rows three and one-half feet apart. The names Italicised are wrinkled varieties.

TABLE.— PEA.

PEA.	Seed from	First bloom.	Days from planting.	Of edible size.	Days from planting.	Days fit for table use.	First ripe seeds.	Days from planting.	Last ripe seeds.	Days from planting.	Number of pods per 100 plants.	Number of peas in 100 average pods.
Advance	D. of A.	May 23	38	June 8	54	17	June 23	69	July 5	81	579	520
Alaska	Cleve	" 23	38	" 8	54	17	" 23	69	" 5	81	481	549
Alaska	D. of A.	" 23	38	" 8	54	17	" 23	69	" 5	81	522	583
Laxton's Earliest of All	Thor	" 23	38	" 8	54	17	" 23	69	" 5	81	529	554
American Beauty	Alex	June 10	56	" 30	76	21	July 12	88	" 28	104	.....	.....
American Champion	Hen	" 6	52	" 21	67	24	" 7	83	" 20	96	1,018	642
Carter's Anticipation	Raw	" 6	52	" 29	75	20	" 7	83	" 29	105	.....	.....
Carter's Lightning	Raw	May 23	38	" 8	54	17	June 23	69	" 5	81	564	548
Delicious	Greg.	June 8	54	" 30	76	11	July 7	83	" 29	105	1,292	475
King of the Dwarfs	Greg.	May 25	40	" 11	57	16	June 27	73	" 8	84	490	504
Lightning	Greg.	" 24	39	" 9	55	18	" 23	69	" 5	81	448	537
Rawson's Clipper	Raw	" 24	39	" 8	54	19	" 23	69	" 5	81	438	593
Sugar or Edible Podded (Fr., St. Desiret Melting)	Vil	June 6	52	" 21	67	21	July 5	81	" 18	94	735	615
Vick's King of the Dwarfs	Vick	May 25	40	" 11	57	16	June 27	73	" 12	88	518	493

The following varieties were edible on the same day, and appear to be identical: Advance, D. of A., Alaska, Cleveland and Dept. of Agriculture, Laxton's Earliest of All, Thor., Rawson's Clipper, Raw. Carter's Lightning, Raw., was also edible on the same day ; Lightning, Greg., was edible one day later; the color of the seed appears to be the only difference between these and the first named varieties. The seed of the first-named varieties is blue and of the latter white.

BEAN.

Seed of the list of beans in the following table were planted May 13. The bush beans were planted in rows twelve feet long, and three and one-half feet apart; the seeds were placed three inches apart in the rows. The climbing varieties were planted in hills three feet apart in the row, and a pole was placed at each hill to support the vines:

	Seed from	First bloom.	Days from planting.	Of edible size.	Days from planting.	First seed ripe.	Days from planting.
BUSH BEANS.							
Ansley's Scarlet Flageolet Wax	Ans ..	June 22	40	July 5	53	Aug. 4	85
Black-Eyed Wax	Greg..	" 21	39	" 7	55	July 30	78
Early Succotash	Sib....	" 27	45	" 8	56	Aug. 3	84
Improved Red Valentine	"	" 5	53	" 11	59	" 11	92
Landreth's Scarlet	Land..	" 24	42	" 8	56	" 9	90
Landreth's Violet	"	" 27	45	" 8	56	" 9	90
Low's Champion	Sib....	" 24	42	" 8	56	" 12	93
Marblehead Dwf. Horticultural	Thor..	" 27	45	" 8	56	" 3	84
Phareolis radiata or Mungo	D.ofA.	Aug. 25	104	Oct. 10	150	Oct. 25	165
Wardwell's New Kidney Wax	"	" 21	39	" 6	54	July 30	78
Wax Date	Sib....	" 24	42	" 6	54	" 27	75
POLE BEANS.							
Brockton	Greg..	July 5	53	July 20	68	Aug. 20	101
Dreer's Gold'n Cluster Wax	Thor..	Aug. 11	90	Aug. 23	102	Sept. 20	130
Early Golden Cluster Wax.	Evt...	" 11	90	" 18	97	" 20	130
Early Golden Cluster Wax.	Hen ..	" 11	90	" 15	94	" 20	130
Early Maine, or Essex prolific	Sib....	July 5	53	July 16	64	Sept. 17	127
Garden Treasure	Evt...	Aug. 11	90	Sept. 1	111	" 25	135
Thompson's Prolific, or Kentucky Wonder	Sib....	July 5	53	July 21	69	Aug. 15	96

Ansley's Scarlet Flageolet Wax produced pods of edible size a few days earlier than any other variety in the list.

There was very little difference in the time of edible maturity of the different varieties of bush beans.

The Brockton pole bean appears to be a desirable variety. It was

productive, and the large green pods splashed with bright crimson make it a desirable market variety.

NOTES ON FRUIT.

STRAWBERRY.—A TEST OF YIELD.

Plants of the following list of strawberries were set out in the spring of 1885, with three exceptions. Two rows of each variety were planted, the rows fifty feet long and four feet apart, and twenty-five plants in each row. The yield of the rows grown in hills, for the season of 1886 was given in the report for that year. The matted rows were from three to five feet in width and thickly filled with plants. The runners were cut off and not allowed to form plants, in the row grown in hills.

The yields of the rows grown in hills are computed for 25 plants or 50 feet of row; the yields from the matted rows are computed for the same length of row. The fruit picked from ten feet in length of the matted row was used in computing the yield. The average number of berries per ounce for each row, also the yields in quarts as computed, allowing twenty ounces of fruit per quart, together with other data, are given in the table.

TABLE—STRAWBERRY.

STRAWBERRIES.	Bloomed.	First berries ripe.	Last berries ripe.	Number of berries produced by matted row.	Number of berries produced by row in hills.	Weight of berries from matted row in ounces.	Weight of berries from row in hills, in ounces.	Yield of matted row in quarts.	Yield of hill row in quarts.	Average number of berries per ounce from matted row.	Average number of berries per ounce from hill row.	Number of days in bearing.
Covill's Early	May 13	June 6	June 29	7,195	.....	537½	.....	26.8	....	13.3	.....	23
Bidwell	May 13	June 13	July 7	2,090	658	193⅛	49¼	9.6	2.4	10.2	13.4	24
Chas. Downing	May 13	June 11	July 6	4,995	772	554⅜	77⅜	27.5	3.8	9.	9.9	25
Cornelia	May 20	June 18	July 13	4,680	503	573¾	79⅝	28.5	3.9	8.2	6.3	25
Daisy Miller	May 17	June 10	July 8	4,145	633	459⅜	72	22.9	3.6	9.	8.8	28
Garretson	May 16	June 7	July 5	5,380	776	617⅛	91⅛	30.8	4.5	8.7	8.5	28
James Vick	May 14	June 14	July 9	6,500	1,418	571⅛	133 5-6	28.5	6.6	11.3	10.5	25
Jersey Queen	May 20	June 18	July 14	3,010	410	542⅝	76	27.1	3.8	5.5	5.4	26
Jucunda	May 14	June 15	July 8	1,120	341	72½	18½	3.6	.9	14.4	18.4	23
Jumbo	May 12	June 17	July 9	6,320	892	1,026⅝	138	51.3	6.9	6.1	6.4	32
Kentucky	May 16	June 15	July 13	5,115	1,106	575	127	28.7	6.3	8.9	8.7	28
Legal Tender	May 14	June 15	July 8	7,300	781	672½	70	33.6	3.5	10.8	11.1	23
Lennig's White	May 13	June 11	July 16	545	179	48½	18	2.4	.9	11.3	10	35
Longfellow	May 16	June 14	July 14	2,580	417	316¼	63⅝	15.8	3.1	8.1	6.5	30
Manchester	May 14	June 11	July 12	7,020	890	778⅜	92⅜	38.9	4.6	9	9.6	31
Manchester (duplicate)	May 16	June 13	July 11	5,245	801	666¼	74⅝	33.3	3.7	7.8	10.8	28
May King	May 13	June 11	July 7	6,260	1,086	627½	102	31.3	5.1	9.9	10.6	26
Mt. Vernon	May 17	June 15	July 9	6,750	1,043	1,046¼	115 7-9	52.3	5.7	6.4	9	24
Mrs. Garfield	May 12	June 15	July 9	.....	1,004	.....	133 5-6	....	6.6	.....	7.4	24
Ontario	May 16	June 8	July 9	.....	364	.....	54	....	2.7	.....	6.8	31
Parry	May 14	June 9	July 10	2,865	584	516¼	91¾	25.8	4.5	5.6	6.5	31
Piper's Seedling	May 12	June 15	July 8	6,640	1,254	638½	109	31.9	5.4	10.	11.5	23
Primo	May 14	June 15	July 9	6,015	1,107	756⅞	145	37.8	7.2	7.9	7.5	24
Prince of Berries	May 20	June 15	July 9	4,495	489	585	55½	29.2	2.7	7.7	8.8	24
Sharpless	May 16	June 14	July 2	2,885	455	533¾	74⅜	26.6	3.7	5.4	6	18
Wilson	May 12	June 7	July 1	7,635	1,803	474⅜	130	23.7	6.5	16.1	13.9	24
Woodruff No. 1	May 12	June 14	July 13	7,920	1,421	846¼	176	42.3	8.8	9.4	8	29

It appears that Covill's Early was the earliest in this list, and Cornelia and Jersey Queen the latest to ripen.

The Lennig's White and Jumbo remained in bearing the greatest, and the Sharpless the least number of days.

The greatest number of berries was obtained from the matted row of the Mt. Vernon, the least from Lennig's White.

The hill row producing the greatest number of berries was the Wilson, the least Lennig's White; Woodruff No. 1 the greatest weight of fruit, and Lennig's White the least weight.

The average number of berries per ounce from the matted rows was 9.2, from hill rows 8.1.

Average yield per matted row 22 quarts, per hill row 7.3 quarts.

Covill's Early. — Plant dwarfish, vigorous; leaves dark glaucous green; fruit medium size, somewhat resembles the Wilson in form, dull reddish color; seeds light yellow, very prominent, giving the berry a rather uninviting appearance; flesh very firm, bright scarlet color; flavor only fair; fruit stalks short; season early. Slightly blighted.

Two new varieties, the Ontario and an unnamed variety received from R. S. Johnston, Shortsville, N. Y., were planted October 1, 1886. The plant and fruit of the Ontario resemble the Sharpless; the fruit is perhaps a little more uniform in shape.

The unnamed variety was very late; June 30 the plants were still in bloom, first ripe fruit June 24, last fruit ripe July 16; fruit medium size, pale dull red color, somewhat resembling the Cornelia; flesh very soft, flavor very sweet and delicious; does not appear to be productive; plants very dwarf; pistillate blossoms.

Excelsior.—A variety received from J. M. Buechley; plants of vigorous growth; fruit medium to large, dark scarlet color, colors up very uniformly, roundish oblong shape, not pointed; flavor good; fairly productive. Appears quite promising.

Miami. Plants set August 20, 1886, received from J. D. Kruschke with the following description: "Plant hardy; fruit large, bright red, solid, good flavor, late; flowers nearly perfect, easily fertilized." The plants produced a few flowers, but no fruit.

The fruit of the James Vick strawberry, like the Wilson, is not fully ripe when it first colors. The fruit should be allowed to become fully ripened before picking, and the flavor will be delicious.

RASPBERRY.

The following list of raspberries were set out in the spring of 1885, with the exception of those printed in italics, which were set in the spring of 1886. The dates of first bloom, first and last ripe fruits, and

the weight of 100 berries of each variety, with a few exceptions, are given in the following table:

RASPBERRY.	First bloom.	First ripe fruit.	Last ripe fruit.	Weight of 100 berries in grams.
Brandywine	June 6	July 12	Aug. 8	124.9
Caroline	May 21	June 29	" 12	123.4
Carpenter's Seedling	June 1	July 4	" 1	127.2
Crimson Beauty	" 7	" 6	" 1	125.7
Cuthbert	" 6	" 12	Aug. 12	206.2
Erie	" 3	" 2	.....	.....
Gregg	May 31	" 9	July 25	130.2
Hansell	" 25	June 27	" 27	172
Johnson's Sweet	" 31	July 5	" 23	.....
Lost Rubies	June 6	" 11	Aug. 1	162.2
Mammoth Cluster	" 1	" 6	July 25	.....
Marlboro	" 3	" 5	Aug. 6	248
Meredith Queen	" 15	" 16	" 1	.....
Miller's Woodland	" 3	" 4	" 6	209.8
Montclair	" 2	June 30	" 3	164.4
Nemaha	May 31	July 6	July 22	.....
Ohio	" 30	" 6	" 23	90
Orange	June 1	June 30	" 30	160.4
Philadelphia	" 2	July 6	" 27	99.2
Reder	" 4	" 4	" 31	177
Schaffer	" 11	" 9	Aug. 13	.....
Souhegan	May 30	" 5	July 23	.....
Superb	June 4	" 6	Aug. 3	.....
Turner	" 3	" 4	July 27	163.2
White Seedling	May 30	June 30	" 25	187.5

Nearly all the plants of the following varieties were destroyed by winter-killing or otherwise: Johnson's Sweet, Mammoth Cluster, Nemaha, Schaffer, Souhegan.

The Hansell ripened the first berries; Meredith Queen was the last to ripen; the Caroline remained in bearing the longest.

Meredith Queen.— Berries medium size, pale red color, very soft, poor flavor; suckers badly, canes rather weak, not productive.

Erie.— Berries medium size, dark purple, resembles the Philadelphia in color; flesh soft, good flavor; canes strong and vigorous; very productive, belongs to the ever-bearing class; blossoms and ripe fruit are upon the canes at the present date (October 25).

Carpenter's Seedling.— Closely resembles Beebe's Golden, early, vigorous grower, does not appear to be of any value.

BLACKBERRY.

In the following list of blackberries the dates of first bloom, first and last ripe fruits were as follows:

	First bloom.	First ripe fruits.	Last ripe fruits.
BLACKBERRY.			
Agawam	May 24	July 18	Aug. 15
Brunton's Early	June 8	" 15	July 27
Crystal White	" 12	Aug. 8	.....
Dorchester	May 31	July 16	Sept. 1
Early Cluster	" 31	" 13	Aug. 15
Early Harvest	June 7	" 11	July 23
Kittatinny	" 3	" 23	Sept. 1
Newman's Thornless	" 4	" 25	Aug. 9
New Rochelle	May 31	" 25	" 12
Snyder	" 31	" 18	Sept. 1
Stayman's Early	" 23	" 16	July 26
Stone's Hardy	" 26	" 23	Sept. 2
Taylor's Prolific	" 28	" 22	" 2
Wilson's Early	June 3	" 16	Aug. 8
Wilson's Junior	" 3	" 18	" 1
DEWBERRY.			
Bartell's	May 24	" 9	.....
Lucretia	" 26	" 9	.....
Mammoth	" 26	" 11	.....

Agawam.— This variety produced very good fruit this season. I consider the flavor the best of any variety in the above list; was not as productive as Taylor's Prolific or Stone's Hardy. The tips of last year's growth were slightly winter-killed. It has made a very strong growth this season.

Early Cluster.— Berries smaller than those of the Agawam, poor flavor; moderately productive; made fair growth of new wood; tips were slightly winter-killed.

Early Harvest.— About one-half of last season's growth winter-killed; made a fair growth of new wood, but produced very little fruit; does not appear to be valuable here.

Stayman's Early.— Has done very poorly, winter-killed badly; fruit small and of very poor quality. One plant of this variety is very badly affected with the rust.

Stone's Hardy.— Promises well; tips slightly winter-killed; has made a good growth of new wood; fruit somewhat smaller than that of the Agawam; fair flavor; very productive.

Taylor's Prolific.— Tips slightly winter-killed; has made very vigor-

ous growth of new wood; the most productive variety in the list; berries large and of fair flavor.

Wilson's Early.—Appears to be of no value here, as it winter-killed badly and has made very poor growth of new wood. Produced a few small berries.

Wilson's Junior—Is of no more value than the Wilson's Early.

There appears to be no difference in the Bartell and the Mammoth dewberries; both have made a very vigorous growth of new wood, many of the branches being from 10 to 15 feet in length. A few berries were produced, some of which were very large; the fruits were sour and of poor flavor.

Lucretia.—The plants were set last spring, and bore a few small berries. The new growth is from 3 to 4 feet in length.

The trailing habit of growth of the dewberry and the numerous sharp spines render it very difficult to gather the fruit.

CURRANT AND GOOSEBERRY.

The following varieties of currant were planted in the spring of 1884 except Fay's Prolific, which was planted in 1883. The data as noted appear in the following table:

CURRANT.	First bloom.	First fruits ripe.	Last fruits ripe.
Cherry	May 4	June 22	July 5
Fay's Prolific	" 4	" 22	" 5
Glorie des Sablons	" 7	" 27	" 7
London Red	" 6	" 27	" 7
Prince Albert	" 6	July 2	" 12
Red Dutch	" 5	June 27	" 5
Short Bunched Red	" 8	" 27	" 7
Versailles	" 4	" 23	" 7
Victoria	" 6	" 25	" 7
White Dutch	" 5	" 25	" 5
White Grape	" 5	" 22	" 5

The black currants and gooseberries in the following tables were planted in the spring of 1882. The dates of the first blossom, first and last ripe fruits were as follows:

BLACK CURRANT.	First bloom.	First fruits ripe.	Last fruits ripe.
Baldwin's Black	May 10	July 8	July 25
Black English	" 10	June 29	" 25
Black Naples	" 10	" 30	" 25
Lee's Black Prolific	" 10	" 30	Aug. 1
Ogden's Black Grape	" 10	" 29	" 1
Missouri Large Fruited	.....	.....	.....
Missouri Sweet Fruited	.....	.....	.....

GOOSEBERRY.	First bloom.	First fruits ripe.	Last fruits ripe.
Downing	May 5	July 14	Aug. 1
Houghton	" 8	" 14	" 1
Industry	" 6	" 8	July 25
Mountain Seedling	" 9	" 25	Aug. 5
Pale Red	" 8	" 13	" 1
Smith's	" 5	" 13	July 25
Wellington's Glory	" 9	" 18	" 28

The Industry gooseberry was badly affected with the mildew this season, so much so that very few fruits ripened.

Mountain Seedling and Wellington's Glory were somewhat affected but much less than the Industry. The other varieties of gooseberries showed but little if any signs of mildew.

APPLE.

The following data were noted of the varieties in bearing this season :

APPLE.	First leaves appeared.	First flowers opened.	First ripe fruits.	First leaves falling.	Last leaves falling.
Aunt Ginnie	May 4	May 16	Sept. 20	Oct. 5	Dec. 6
Ben Davis	" 4	" 13	Oct. 1	" 8	Nov. 25
Brownlee's Russet	" 9	" 14	" 1	" 10	Dec. 9
Carolina June	" 5	" 14	July 23	" 5	Nov. 25
Cox's Pomona	" 6	" 14	Sept. 5	" 3	" 25
Early Harvest	" 4	" 13	July 20	" 5	" 19
Jefferis	" 4	" 11	Aug. 20	" 5	Dec. 2
Jersey Sweeting	" 4	" 13	" 20	" 5	" 6
Keswick Codlin	" 4	" 11	Sept. 5	" 3	" 6
Lord Suffield	" 4	" 11	Aug. 25	" 3	Nov. 18
Maiden's Blush	" 6	" 16	Sept. 25	" 5	" 24
Primate	" 4	" 11	July 20	" 3	" 25
Red Transparent	" 3	" 11	" 27	" 8	" 21
Rome Beauty	" 6	" 16	Sept. 20	" 5	Dec. 9
Small's Admirable	" 6	" 13	" 6	" 4	" 9
Tetofsky	" 8	" 13	July 20	" 1	Nov. 10
Wagener	" 5	" 13	Sept. 25	" 28	Dec. 9
William's Favorite	" 6	" 13	Aug. 1	" 5	Nov. 22

GRAPES.

There are fifty-seven varieties of grapes growing at the Station, twenty-four of which bore fruit the past season.

The following data were noted:

GRAPES.	First leav's appeared.	First flowers opened.	First ripe fruits.	First leav's falling.	Last leaves falling.
Amber Queen	May 10	June 6	Sept. 17	Oct. 8	Oct. 26
Barry	" 9	" 7	" 13	" 3	Nov. 2
Brighton	" 9	" 10	" 3	" 5	" 2
Burnet	" 10	" 10	" 13	" 8	Oct. 26
Catawba	" 11	" 12	Oct. 3	" 10	" 27
Champion	" 9	" 22	Aug. 29	" 3	Nov. 2
Duchesse	" 10	" 13	Sept. 21	" 8	Oct. 26
Early Victor	" 13	" 14	" 26	" 10	Nov. 2
Francis B. Hayes	" 10	" 10	" 4	" 8	Oct. 26
Highland	" 11	" 13	" 24	" 8	" 26
Iona	" 13	" 13	" 27	" 8	" 27
Jefferson	" 11	" 11	Oct. 11	" 18	Nov. 12
Jessica	" 11	" 11	Sept. 13	" 10	" 12
Lady Washington	" 10	" 10	" 28	" 8	Oct. 26
Lindley	" 11	" 10	" 27	" 5	" 27
Marvin's Centennial	" 11	" 10	" 28	" 11	" 27
Monroe	" 10	" 8	" 13	" 8	" 26
Moore's Early	" 10	" 7	" 3	" 3	" 26
Rochester	" 12	" 7	" 10	" 3	Nov. 12
Salem	" 7	" 6	" 5	" 3	Oct. 26
Seedling (Jas. M. Paul)	" 9	" 8	" 1	" 3	" 26
Senasque	" 11	" 13	" 13	" 8	" 27
Vergennes	" 13	" 8	" 19	" 8	" 27
Wilder	" 9	" 7	" 21	" 3	" 26
Worden	" 11	" 10	" 17	" 10	" 28

The season has been favorable for the ripening of even the latest varieties.

The seedling received from James M. Paul, North Adams, Mass., appears to be a promising early white variety.

I think the quality of the Amber Queen was much inferior this season to what it was last; the bunches also were smaller and less compact.

The Champion was the earliest to ripen; the fruit is of inferior quality.

The Jefferson was the latest to ripen; the fruit of this variety was sweet and of excellent quality.

The fruit of the Senasque, Early Victor and Duchesse cracked quite badly.

NOTES ON MILDEW AND ROT.

Marvin's Centennial and Senasque were most affected with the white mildew, *Unicula spiralis*.

Burnet, Catawba, Iona and Lady Washington were considerably affected.

Amber Queen, Barry, Brighton, Champion, Hayes, Monroe and Salem were very slightly mildewed.

The fruit of Senasque, Monroe, and Rochester was considerably affected with rot after the berries had attained full size and were nearly ripe. Lady Washington and Duchesse were very slightly affected.

The appearance of the diseased fruits did not answer to the description of the rot as described by Prof. Scribner.*

It differed from the description in that the skin of each berry was ruptured. Specimens of the diseased fruit were forwarded to Prof. Scribner, and the assistant in charge, Mr. B. F. Galloway, succeeded in finding the mycelium of *peronospora viticola* ("brown rot") in some of the berries, although there was no external evidence of the presence of the fungus.

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* Report on the Fungus Diseases of the Grape Vine by F. Lamson Scribner, B. Sc., Bulletin No. 11, D. of A., 1886.

REPORT OF THE BOTANIST.*

The present report covers the eight months of 1887 from January to August, inclusive. A few series of observations have been extended beyond this time and completed through the kindness of Mr. E. S. Goff and Mr. M. H. Beckwith, of the horticultural department of the Station. The report embraces a study of the potato scab and the conditions which influence its development; further discoveries in the life history of the plum-leaf fungus; the use of sulphide of potassium in the treatment of several plant diseases; notes upon apple and pear scab; disease of clover-leaf weevil, peach curl, gooseberry mildew; the constancy of leaf characters of the wild dandelion under cultivation, and a form of constant temperature apparatus for the germination of seeds at their upper limit of growth.

The weed statistics are continued regarding the number and kind of weeds that grow on one-twentieth of an acre during a season; besides this the number of germinations from a square foot of soil, taken to the depth of three inches or less, are given, and some items relating to the germination of weed seeds.

A convenient summary of the subject-matter of the four reports of the botanist to the Station, the dates and form of publication of these reports, and an index to them complete the present report. The order of topics is as follows:

Potato scab.
Plum-leaf fungus.
Sulphide of potassium as a fungicide.
Fragmentary notes:
- Scab and rust of apples and pears.
- Disease of the clover-leaf weevil.
- Peach curl.
- Gooseberry mildew.
- Constancy of characters in the wild dandelion.
- Constant temperature apparatus.

Weed statistics:
- Weeds on one-twentieth of an acre.
- Weeds from one square foot of soil.
- Germination of seeds.

*J. C. Arthur.

Summary of botanist's reports for 1884-7.
Publication of reports for 1884-7.
Index to botanist's reports for 1884-7.

THE POTATO SCAB.

The potato crop is much deteriorated each season by roughened spots on the surface of the tubers, varying from shallow to more or less deep-seated concavities filled with effete matter. This affection is so common and uniform in its features that every reader will at once recognize it under the name of scab.

The scab makes its appearance upon the tubers in the hill when they are no larger than hazel-nuts or even smaller. It first shows as irregular, superficial, very small spots, which lose the pale, smooth look of the healthy skin, and turn brown and rough. These spots continue to increase in diameter and depth until the potatoes are removed from the ground at harvest time. Other centers of scab arise as the tubers grow, and when sufficiently numerous coalesce, and in extreme cases envelope the whole tuber. As the spots enlarge they do so at the expense of the tissues of the potato lying beneath them, which pass over into a spongy brown substance filling the cavity of the scabbed spot. The change in the tissues is not a truly putrefactive one, but a gradual loss of life in the cells of a well-defined area, followed by a very slow decomposition. Beneath the spots the substance of the tuber remains unaffected.

The cause of potato scab has been long in dispute. The explanations which have recently found most favor in American journals, ascribe it on one hand to the attack of parasitic fungi, and on the other hand to the depredations of worms, grubs, myriapods, or other small animals in the soil. It is not the present purpose of the writer to attempt a refutation of either view, but attention is called to the significant fact that mycologists and entomologists who have looked into the matter find no good grounds for such explanations. One of the strong arguments, moreover, against these views, although by no means an unanswerable one, is that no particular kind of fungus or small animal, in truth no fungus or animal at all, can be found to invariably accompany the injury at any particular stage of its development.

A study of the minute structure and growth of the spots throws some light upon the matter. The potato tuber is enveloped by a thin skin, readily separable as a semi-transparent delicate membrane when the tuber is cooked by boiling. This membrane is nearly or quite impervious to moisture and gases. It thus protects the interior tissues

against harmful substances in solution in the soil, and also keeps them from drying out, whether the tubers are in or out of the ground. This surface membrane, or skin, is made up of several layers of regular flat cells, fitting together so closely as to leave no spaces between the corners, and without a deposit of starch as in the other tissues of the tuber. Chemical tests show that the substance of the cell-walls is different from that of the walls of the other tissues; in short the skin of the potato is a thin layer of delicate cork. Figure 1 shows a magnified section of the skin and some of the tissues just beneath it.

A microscopic examination of scab spots of different ages discloses the fact that they are produced by the outer cells of the corky layer of the skin dying, and separating to form the loose brown dead matter which contributes so much to the rough appearance of the diseased tubers. Long soaking of scabbed potatoes permits this dead part to be completely washed away, leaving the corky skin beneath. As the outer cells of the skin die at the scabbed spots, new ones are formed within at the expense of the other tissues immediately beneath. Thus the scab eats its way deeper and deeper into the tuber.

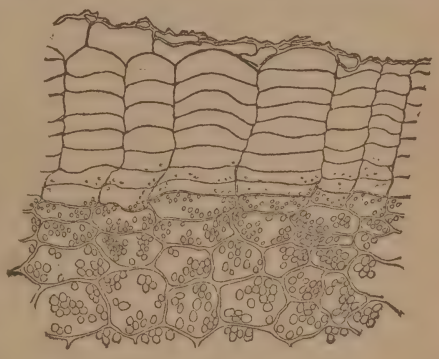

FIGURE 1.

Transverse section from a half-grown tuber, showing at the upper part of the figure the collapsed and broken cells from the surface of the potato, through the middle the broad band of rectangular cork cells forming the skin of the potato, and at the lower part the starch-bearing cells like those which form the larger part of the tuber. Magnified 125 diameters. Original.

It is scarcely possible to say at present wherein the true cause resides that brings about this abnormal production of cork cells and the consequent loss of surface cells to form the scab. Over twenty-three years ago Dr. Nobbe,* in raising some seedling potatoes by water culture, observed that the tubers growing in the confined air of vessel above the water were normally smooth, while those under the the water were covered with glistening white warts produced by the excessive growth of lenticels, and he suggested that this "might possibly contribute to the explanation of the formation of scab in the field."

Lenticels are normal structures which serve for the ready exchange of gases (oxygen, carbonic dioxide, etc.), between the inside and out-

*Landwirthsch. Versuchs-Stationen, VI, 1864, p. 60.

side of stems living for more than one year. In the potato tuber (which is an underground stem) the lenticels are scattered without order over the surface and are less than a pinhead in diameter. They are not conspicuous in the stored tubers, but in young or freshly dug tubers they are usually easily seen, especially if permitted to swell up by being placed in water for a day or more. Lenticels have a corky texture, but the cells are rounded and permit the passage of air between them. Figure 2 shows a vertical section from the skin of a young potato (one inch in diameter), passing through a lenticel. Before making the section the skin was entirely separated from the other tissues of the tuber by masceration, thus exhibiting more clearly the exact thickness of the skin and the nature of the break in continuity made by the lenticel.

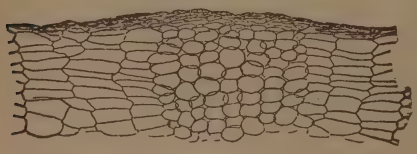

FIGURE 2.

Transverse section of the skin of a young potato, cutting through a lenticel. Magnified 85 diameters. Original.

Ten years before Dr. Nobbe made the remark quoted above, a careful account of the scab — its appearance, microscopic structure and origin, together with the conditions favoring its growth — was given with fine illustrations in a report on investigations undertaken for the Prussian government by Dr. Schacht.* He pointed out that the conditions favoring the excessive growth of the lenticels also help to carry this growth over into the form of scab, and that marl, bog iron and street sweepings applied to the soil are supposed to have something to do with the increase of the trouble, and adds: "I must consider great moisture of the soil as the first cause." Little substantial addition has been made to our knowledge of the subject since the time of Schacht.† The latest and most complete account is by Sorauer‡ in his new handbook of plant diseases.

The experiments undertaken by the Station this season to test some points in connection with the question of scab have been in charge of Mr. M. H. Beckwith, the assistant horticulturist, and a full account of them will be found in his report in this volume. There were four points aimed at, as follows: To test the influence upon the crop (1) of the use of scabbed potatoes for planting, (2) of the application of fungicides and special fertilizers, (3) of the degree of moisture in the

* Bericht über die Kartoffelpflanze und deren Krankheiten, 1854, p. 24.

† His report furnishes the basis of what is given in the Rep. Conn. Agric. Exper. Station, 1877, p. 67, and 1886, p. 79.

‡ Pflanzenkrankheiten, 2te Aufl., 1886, p. 227.

soil, and (4) of the use of stable manure. Upon the first and second points the results are not specially convincing, but there seems to be no room for doubt that as regards the amount of moisture in the soil and the presence of stable manure both materially increase the quantity of scab. It is probable that stable manure acts chiefly by raising the percentage of moisture retained by the soil. Altogether, the result of the experiments seems to bear out the hypothesis of Schacht that the chief cause of potato scab is the deleterious action of soil moisture on the skin of the tuber; the incidental circumstances which favor the action cannot be discussed at this time.

PLUM-LEAF FUNGUS.

A very full account of this fungus, its appearance, transformations, development and influence upon the health of the plum and allied trees, was given in the last report of this Station,* and it is only necessary at present to supplement that account by some additional items the result of later studies, especially in regard to the form and occurrence of the perfect spores, and the value of topical applications for checking the spread of the fungus.

It has already been stated that the fungus continues its growth after the leaves fall to the ground, the abundant production of spores on the green leaves being replaced, as winter comes on, by spores of a different sort on the now dead leaves, and the whole aspect of the fungus becoming changed; with the advent of spring another change takes place, and the life cycle is completed by the production of ascospores, the presence of which in any fungus is taken to indicate the highest development that the species attains.

The course of development of the spores has been studied with a great abundance of material, provided through the kindness of Mr. William Smith, of Geneva, who permitted some ground, well covered with fallen plum leaves bearing the fungus, to lie uncultivated until after my studies were completed. As noted in previous years, the asci, or spore sacs, can be seen by the first of May, but without well-defined spores.

The ascospores were found toward the latter part of May, and were well developed by June 1st. These spores are linear, somewhat curved (not oblong, as stated in last year's report, p. 296), nearly the length of the sac, in which they are closely packed, and from which owing to their colorless and delicate walls they are with difficulty distinguished when the sac is unruptured. Figure 3 shows a sac filled

* Report for 1886, p. 293.

FIGURE 3.

An ascus filled with spores, with two paraphyses attached to it, and five free spores. Magnified 290 diameters. Original.

with spores, and beside it two of the sterile filaments usually associated with such sacs, but of no interest in this connection, together with some free spores. The sacs and their accompanying filaments are ranged side by side in a uniform layer, which is for a while entirely surrounded by a black covering that the fungus forms in the remains of the dead leaf. When the spores are ripe the covering breaks away above the layer, and they are free to escape; this layer is always of the same depth, but of variable breadth. Figure 4 shows a vertical section through a leaf containing two small fruiting cavities. The covering has already opened over the center of each. At this state of development the spores are ready to be ejected, and to be deposited by the wind on the surface of the green leaves of plum trees in the vicinity, to start anew the septoria condition, leading to the early destruction of the foliage.

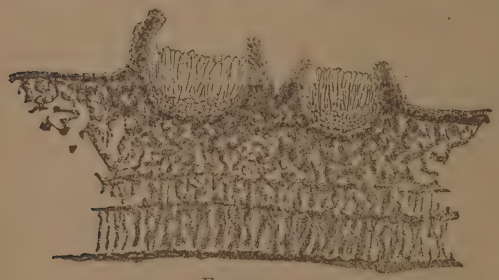

FIGURE 4.

Vertical section of two perithecia, showing mature asci. Taken from a leaf gathered June 18. Magnified 110 diameters. Original.

The report of last year advises to "spray the foliage during May and June, or even longer, with some fungicide," and hyposulphite of soda or sulphide of potassium are recommended for trial. This suggestion was put to the test by using the latter substance, applying it in a solution of one-half ounce to the gallon of water, from May 25 to June 27. (The details of this experiment are given at another place in this report.) Very encouraging results followed, but it was evident, that for this season at least — the earlier part being unusually dry — the spraying need not have been started so early, and should have been continued longer. Septoria spots were not found on the leaves till about the middle of June, and the spraying need not have begun much earlier than this. Further trials will be needed to settle the details of the method to insure uniformly good results.

SULPHIDE OF POTASSIUM AS A FUNGICIDE.

Sulphur has been the general remedial agent with gardeners, horticulturists and agriculturists for all disorders of plants, either due, or supposed to be due to the incursions of fungi, from a time much beyond

the memory of the present generation of investigators. Flowers of sulphur is the form most convenient of application, and the one in common use. More thorough and accurate observations in recent years, together with a better knowledge of the plant maladies which it is intended to disperse or prevent, have demonstrated that the useful application of sulphur is more limited than previously supposed.

For additional remedies, attention has naturally been turned to the compounds of sulphur, and especially to the sulphates, sulphate of iron and sulphate of copper being found of service in combating a number of forms of plant diseases.

Some two or three years ago the sulphides began to receive attention in Europe, particularly the sulphide of potassium, which was found a valuable exterminator of the surface or powdery mildews. The same agent was tried to some extent in this country last year (1886), a few brief accounts being given in the agricultural and gardening journals.

At the opening of the present season (1887), it was planned to give this substance a thorough trial upon several diverse forms of plant diseases, not only on those which grow upon the surface of the host and are therefore easily reached by topical application, but on the endophytic forms which grow, with the exception of their spore-forming parts, inside the host.

Gooseberry Mildew. — On June 4 a solution of the strength of one-half ounce of the sulphide of potassium to a gallon of water was sprayed over two plants of considerable size of the Industry gooseberry, an English variety, the ends of the branches and a part of the fruit being quite completely enveloped with the common gooseberry mildew (Sphærotheca Mors-uvæ B. and C.) In places the mildew had passed the first or conidial stage, when it is glistening white with powdery spores, and had reached the second stage, forming a brown felted layer on which are produced minute black fruit-dots containing the winter spores. The mildew had already affected the growth of the plants, having caused the new growth of stems to become more than normally thickened, and also stunted the development of the new leaves. Some seedling gooseberries of two years' growth, almost as much diseased, were also sprayed with the solution at the same time.

The spraying was repeated on June 9, 20 and 27, each of these dates being subsequent to a shower which presumably washed off the sulphide from the bushes.

The beneficial effects were noticeable from the first; most of the fungus in its early white stage was killed, and the production of summer spores fully checked for the time being. The part of the

fungus which had become brown, however, was proof against the application, having no appearance of being affected in the slightest degree. Obviously it was impossible on this account to rid the plants of the parasite, and while the fungicide did much to mitigate the evil, it did not eradicate it.

Enough was accomplished, however, to show that, if taken in time, gooseberries may be kept entirely free of mildew by a proper application of sulphide of potassium in solution, and without the slightest detriment to the foliage or fruit.

Pear Scab. — The good results which have appeared to follow the use of hyposulphite of soda for pear and apple scab in the hands of Mr. Goff, as detailed in former reports of this Station, suggested the use of sulphide of potassium in the same way, as probably having stronger fungicidal properties and less likely to injure the foliage.

The solution of the strength of one-half ounce of the sulphide to a gallon of water was sprayed upon half the top of a vigorous fruiting tree of each of three varieties of pear — Flemish Beauty, Seckel and Mt. Vernon. Both fruit and leaves of the first and second of these have in former years been badly disfigured and injured by the scab or rust (Fusicladium pyrinum).* Applications were made on May 25, June 1, 4, 20 and 27. The fungus did not, however, appear on either the unsprayed or the sprayed parts in harmful quantity, probably because of the comparatively dry weather; and the fruit having passed the period of growth most susceptible to attack of the fungus, the experiment was given over, without having reached any result more important than that the application does not injure or in any way affect the green or other parts of the tree.

Diseases of Plum Leaves.— The premature falling of the leaves of plum trees, as described on another page of this report, is a sufficiently serious malady in this locality, and doubtless elsewhere, to make a remedy, if only a partial one, desirable.

Two rows thirty feet long of three-year-old trees in the midst of nursery stock, kindly placed at my disposal by the owner, Mr. William Smith, were sprayed at the same time and in the same manner as the pear trees mentioned above.

But faint results were observable at the time of the last spraying the last of June, the fungus not having appeared in sufficient quantity to be conspicuous, but in July and even as late as the last of August, the difference between the sprayed and unsprayed trees was

* For a description of the fungus and its effect see Third Annual Rep. N. Y. Agric. Exp. Station, 1884, p. 367.

strongly marked by the less spotted and clearer green foliage and its greater persistence. It seems probable that much better results would have been attained if the main part of the spraying had been done during July and extending into August.

The theory of the action of the fungicide is that the spores are prevented by its presence from germinating upon the surface of the foliage, and the fungus thus kept from entering the leaf, and that both the fungus threads and spores are killed by contact with it. The injury, resulting from the growth of a single spore rarely exceeds a spot one-eighth of an inch in diameter. The effect of one or a few spores upon each leaf is therefore insignificant; it is the great numbers that do mischief. While it is doubtless impossible to entirely prevent the growth of the fungus in the leaves, yet the feasibility of arresting the considerable increase of the spots by suitable topical applications seems reasonable. Whether sulphide of potassium will prove to be such a preventive must be the work of several years to ascertain, but the present season's test looks favorable.

Strawberry Leaf Spot.—A part of a bed of Sharpless strawberries was sprayed four times during June with the strength of solution already mentioned, with the object of holding in check the spotting of the leaves due to the fungus, Ramularia Tulasnei, often described as "sunburn." The object sought was attained, as that part of the bed took on a more vigorous growth and showed fewer spotted leaves than the remainder. In fact the difference between the sprayed and unsprayed portions was so marked that it seems unsafe to ascribe it wholly to the fungicide, it being better to content one's self with the strong indication that the sulphide is likely to prove a serviceable preventive of this disease, and to leave the question of its full efficiency to be determined by future trials.

Other Diseases.—Application of the fungicide was also made at the same time and in the same manner as already mentioned to currant bushes and quince trees. No results were obtained with the currants, where it was hoped to check the common spotting of the leaves caused by the growth of a fungus. The results with the quince trees were equally indifferent. The object in view was to see the effect of the fungicide upon the mildew (Podosphæra tridactyla) and the leaf spotting (Morthiera Mespili, var.), but neither fungus appeared in sufficient abundance to permit of definite observations. After the spraying was begun, and before it was ended, another disease took possession of the trees — the twig blight, due to the same cause as pear blight — and from six inches to a foot or more of the ends of many of the branches died. There was no appreciable difference between the sprayed and

unsprayed parts of the tree regarding the amount of blight. The test in this case seems to be entirely satisfactory, and, taken in connection with the failure of hyposulphite of soda last year (Report for 1886, p. 178), is strong evidence in favor of the opinion that the usual manner of applying soluble fungicides and insecticides by spraying is not likely to prove of any service against pear blight, twig blight, and the other forms of the same disease.

General Remarks.— Although for part of the tests the season has proved unpropitious, and in no case was the series of applications made in as complete a manner as could be desired, yet the results are encouraging and warrant the belief that sulphide of potassium will yet prove one of the most valuable fungicides for certain plant diseases, especially those caused by epiphytic fungi, that has so far been tested.

Sulphide of potassium is a solid olive-green substance, usually seen in broken cakes, readily soluble in water, with a rather strong, unpleasant smell, somewhat like that of rotten eggs, but not corrosive to the skin or to clothing. It is sometimes called "liver of sulphur." It sells at retail for twenty-five to sixty cents a pound, according to quantity and place of purchase.

The strength of solution of one-half ounce to a gallon of water is probably the maximum ever required; and it may be found upon further trial that one-half that strength will answer the purpose equally well. Not the slightest injury resulted to the foliage of any of the plants sprayed with it, and if anything were to be gained a stronger solution could just as well be used. As it is not a poisonous substance, unless swallowed in very large doses, no harm will result in spraying fruit which is shortly to be gathered for eating.

The spraying was performed with a Nixon nozzle and force pump, which throws a fine spray with much force to a considerable height, and is rapidly operated. By shifting the direction of the spray, all parts of the foliage are speedily wet with the solution. What falls upon the ground is not lost to the cultivator, for it is a substance that possesses high manurial value as a potash salt. In fact the whole of the substance used for spraying, when finally washed into the ground, becomes available food for the vegetation which it has already served to protect more or less efficiently from fungous ravages.

FRAGMENTARY NOTES.

Scab and Rust of Apples and Pears.— The rust or scab, which usually shows itself in early spring and continues through the season on leaves and fruits, did not become noticeable this year till July. This tardiness in starting may be reasonably ascribed to the dryness of the first

half of the year, which prevented the spores from finding sufficient moisture to germinate readily on the surface of the green parts and become established.

Disease of the Clover-leaf Weevil.— Only one larva of this insect was found in the spring of 1887. The fungous disease of the larvæ, described in the two preceding reports, appears to have nearly exterminated the insect from this locality.

Peach Curl.— The early part of the season of 1887 was unusually dry. Whether this prevented the development of the curl or not is uncertain, but for some reason it was almost entirely absent this year. Usually the peach trees of the Station have lost considerable of their foliage by June 1st on account of it, and suffered much in consequence. If it arises each season chiefly from mycelium remaining in the tree over winter, as is certainly the case to some extent, it is difficult to understand why the dry weather should have interfered so much with its development. On the other hand, if it starts each season chiefly from the germination of spores carried to the surface of the tree by the air, it is easy to see that a dry atmosphere would give little chance for the requisite moisture to enable the spores to start into growth, and thus the trees would be saved from the disease. The latter view is strengthened by the observation made two years ago that when all limbs showing any trace of the disease were kept cut away during the whole of the growing season, the tree showed no sensible decrease in the amount of curl the next year.

Gooseberry Mildew.— Foreign varieties of the gooseberry when grown in this country are so generally attacked and injured by mildew that their cultivation is not commonly attempted, and then rarely with success, although the fruit is much larger and finer than that of the native varieties. The particular mildew which in Europe is called the gooseberry mildew, or "blight" as the English usually speak of it (*Microsphæra Grossulariæ* Lév.), is not the one which interferes with cultivation in this country. Our gooseberry mildew is a species of Sphærotheca. It has been referred to as Sphærotheca pannosa Lév. by Bessey* and others, a species which infests the leaves and stems of roses and peach trees in both Europe and America, but, as pointed out by Burrill,† it is doubtless a distinct species that was first described by Schweinitz‡ under the name of Erysiphe Mors-uvæ, and is now

*Erysiphe, p. 3; Bulletins Iowa, Agric. Col., Nov. 1884, p. 141; Arthur in Trans. Iowa Hort. Soc., 1883, p. 315.

† Bulletin Ill. St. Lab., vol. II, p. 399.

‡ N. Amer. Fungi, p. 270

known as Sphærotheca Mors-uvæ B. & C. It appears to be indigenous to North America. Its depredations in the garden, however, are chiefly confined to varieties of transatlantic origin. On these it checks the growth and when abundant dwarfs the whole plant, while the fruit is disfigured and rendered worthless. The ends of the branches are the principal seat of the fungus; these become thickened and succulent, the leaves on them remain small, are close set, and drop prematurely. The fungal threads overspread the surface of the host without penetrating into its interior. They are at first pure white, and with the white spores produce a glistening effect. As the threads grow to be more abundant, they change color and form a characteristic thick brown felt over the branches and fruit. The felted masses may be scraped from the gooseberry fruit, leaving the surface normally smooth and green. The white spores, produced in the greatest abundance, are for the immediate and speedy extension of the fungus to any suitable spot that they may be blown to. The brown felted masses bear small dark bodies, just large enough to be seen with the unaided eye, in which are also spores. The latter sort (ascospores) germinate the following spring, and are the means of continuing the disease from year to year. A remedy of much promise is spoken of in another part of this report.

Constancy of Characters in the Wild Dandelion.— The varieties of cultivated dandelion show a considerable range of variation in the characters of the leaves, extending from the finely cut or mossy forms to the broad, even forms, and these varieties are quite constant when propagated by seed. It was suggested by the Director of the Station that counterparts of these varieties might possibly be found among wild forms, and that they might show a like constancy of characters when introduced to cultivation. The subject has an important bearing upon the origin of garden varieties, and the possibilities in the way of originating new varieties. It was decided to select as diverse forms of wild plants as possible and transfer to the garden. This was done in spring, when the leaves show the greatest variation. There were four classes — those with finely cut, light green leaves; those with finely cut, dark green leaves, spotted and edged with brown; those with least uneven, light green leaves, and those with least uneven, dark green leaves. In the rich soil of the garden they grew finely, and by September first were large plants. At this date there was still a considerable difference between the light and dark green forms, but the shapes of the leaves exhibited less difference, all having approximated to a much cut and irregular pattern. Although the leaves had grown large, they retained their habit of reclining, instead of standing

upright as the garden varieties do. None of the plants have approached, either in shape of leaf or in habit, the cultivated varieties, the chief change that has taken place, aside from size, being in the greater or less dissection of the leaves. The result of one year's observation upon such a question has little value further than to direct additional attention to an important subject. The trial should be carried through several seasons with observations upon the same individuals, and supplemented by ascertaining the constancy of the characters in plants raised from seed through several generations.

Constant Temperature Apparatus.— Considerable time has been given to perfecting an apparatus for keeping a constant high temperature in a space large enough to permit of the introduction of one or two germinating pans for testing seeds. The question to be decided by the apparatus was the highest point at which different seeds will germinate, taking the element of time into consideration. This required some means of keeping a temperature that would not vary more than one degree, or less if possible, for a week or two at a time, or even longer. The chamber had to be heated with a kerosene flame, as gas was not available, and so none of the usual forms of heat regulators could be used. The machine as finally arranged, and which reached a fair state of efficiency, consisted of a chamber, something more than two feet cube, surrounded by dead air spaces, with a copper reservoir of water in the bottom, so connected by pipes with a jacket about the flame of a kerosene lamp as to secure a flow of water. Cold air for lowering the temperature of the chamber when too hot was taken from the bottom of an ice chest placed higher than the chamber in order to secure a flow of air. Valves were placed in the cold air conduit, in the top of the chamber, for escape of hot air when cold air was admitted at the bottom, and in the top of the ice chest, to allow as much air to pass in as was drawn off to supply the chamber. These three valves were automatically opened and the lamp turned down when the temperature of the air in the chamber reached the highest permissible point, and were closed and the lamp turned up again when it dropped to the lowest point — the variation being a degree or less. The power for making these changes was secured by means of a clock work having a heavy spring, reinforced to any extent with a weight and system of pulleys. The clock was set in motion by an electromagnetic connection with a vibrating thermostat placed in the chamber, regulated to the desired degree of temperature. It was found that, although no fault could be detected in the apparatus, there was still an uncontrollable although slight variation of temperature disturbing the nicety of the results, doubtless to be ascribed to the great

changes of temperature in the room in which the apparatus stood. It is believed that if it were placed in a room having at the most only five to ten degrees of fluctuation, there would be no further hindrance in securing absolutely satisfactory results.

WEED STATISTICS.

The problem of the weeds is one that every cultivator finds sufficiently perplexing at all times. It is a question that must have an answer of some sort, and the answer that can stand the test of practical application, giving upon trial the least loss and the greatest gain, is the best one. The statistics which are given in this connection are presented with the hope of adding a little to the knowledge of the subject, and to the elucidation of the problem.

The number of weeds of different kinds growing upon one-twentieth of an acre was determined by the same methods used last year and the year before.* This year, as in the preceding years (although not so stated in former reports), the land was plowed and harrowed in May, and then left undisturbed for the remainder of the season, except the small disturbance of the surface in pulling up the weeds at the time of counting. The plowing did not take place until after many seeds had begun to grow. This probably does not materially affect the results, as the seeds which finally grew are those turned up by the plow, while those that were at or near the surface were mostly buried too deep to grow during the current season.

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* Report for 1885, p. 262; 1886, p. 298.

Weeds Growing on One-Twentieth of an Acre.

COMMON NAME.	LATIN NAME.	A.	B.		C.
		1885.	1886.	1887.	1887.
Three-seeded Mercury	Acalypha Virginica L.	2	18	12	41
Couch-grass	Agropyrum repens B.	.....	46	590	.....
Pigweed	Amarantus albus L.	.....	2	6	39
Redroot	Amarantus retroflexus L.	4	134	380	1,395
Ragweed	Ambrosia artemisiæfolia L.	62	48	20	3,022
Burdock	Arctium Lappa L.	1	.....	.....	11
Milkweed	Asclepias Cornuti Dec.	67	.....	.....	43
Shepherd's Purse	Capsella Bursa-pastoris M.	2	18	5	55
Mouse-ear Chickweed	Cerastium vulgatum L.	.....	3	.....	5
Pigweed	Chenopodium album L	21	400	244	1,866
Ox-eye Daisy	Chrysanthemum Leucanthemum L.	3	.....	.....	8
Canada Thistle	Cnicus arvensis Hoffm.	4,380	8	930	105
Spurge	Euphorbia maculata L.	69	3	62	822
Catnip	Nepeta Cataria L.	2	.....	.....	2
Wood Sorrel	Oxalis corniculata L., var.	62	1	2	4
Witch Grass	Panicum capillare L.	123	12	11	57
Barn-yard Grass	Panicum Crus-galli L.	11	10	150	317
Low Finger-grass	Panicum glabrum Gaud.	516	4	34	11,790
Timothy	Phleum pratense L.	27	.....	.....	1
Ground Cherry	Physalis Virginiana Mill.	.....	1	1	.....
English Plantain	Plantago lanceolata L.	162	1	.....	356
Common Plantain	Plantago major L.	10	4	.....	41
Common Plantain	Plantago Rugelii Dec.	1	21	.....	201
Fowl Meadow-grass	Poa serotina Ehr.	.....	4	7	3
Knotgrass	Polygonum aviculare L.	7	21	12	71

Weeds Growing on One-Twentieth of an Acre.—(Continued.)

COMMON NAME.	LATIN NAME.	A.	B.		C.
		1885.	1886.	1887.	1887.
Black Bindweed	Polygonum Convolvulus L.	12	81	52	6
Lady's Thumb	Polygonum Persicaria L.	120	831	684	468
Purslane	Portulaca oleracea L.	.....	6	176	10,335
Smooth Sumac	Rhus glabra L.	1	1	.....	1
Sheep Sorrel	Rumex Acetosella L.	20	.....	.....	2,490
Curled Dock	Rumex crispus L.	3	.....	.....	3
Groundsel	Senecio vulgaris L.	.....	2	6	60
Fox-tail Grass	Setaria glauca Beauv.	2,233	133	1,843	2,643
Pigeon Grass	Setaria viridis Beauv.	420	1,810	6,787	816
Sow Thistle	Sonchus asper Vill.	.....	3	24	.....
Sow Thistle	Sonchus oleraceus L.	1	.....	2	2
Sorghum	Sorghum vulgare L.	.....	173	2	.....
Dandelion	Taraxacum officinale L.	129	6	.....	28
Red Clover	Trifolium pratense L.	4	122	2	1,205
Yellow Clover	Trifolium procumbens L.	1	.....	1	117
White Clover	Trifolium repens L.	37	122	23	35
All other kinds	.....	296	46	.....	18

Two plats were selected this year on which to determine the number of weeds, one being the same as used last year, and the other a piece of ground just turned over from an old meadow. The latter lay adjoining a roadway, and was found to be very full of foul seed. Neither piece of ground has received stable manure for a number of years, if at all. The countings were made about the first of July, August and September, the larger weeds being pulled and removed from the ground each time, leaving the smaller ones to grow until the next counting, the ground being cleared at the last date.

The three plats of ground used for these experiments lie near one another, having practically the same kind of soil and exposure, and differing chiefly in the length of time since they were in meadow. The plat used in 1885 is marked A in the table, that used in both 1886 and 1887 is marked B (C 11 in the records of the Station), and the second plat used in 1887 is marked C (G 2 in the records of the Station).

The table includes by name those species that occurred in 1887, and also in one or both of the preceding years. Those which occurred in 1885, but not in the other years, are as follows, with the number of individuals of each: Anemone Virginiana 1, Ambrosia trifida 68, Aster Novæ-Angliæ 3, Hypericum mutilum 1, Lactuca Canadensis 1, Pastinaca sativa 3, Poa pratensis 194, Polygonum acre 14, Polygonum Pennsylvanicum 2, Rubus strigosus 5, and Solidago Canadensis 4.

Most of these species are adventive from the meadow, which in this case had only been turned under at the last plowing; they would not withstand much tillage. The largest number of individuals is of Kentucky blue grass. The kinds which occurred in 1886 and not in other years, with the amount of each, are as follows: Helianthus annuus 40, Lycopersicum esculentum 1, Stellaria media 1, Verbascum Thapsus 3, and Veronica peregrina 1. These species belong to cultivated ground, being in part, not weeds proper, but accidental sowings of cultivated plants, which had occupied the ground or the vicinity the previous years. No species was recorded in both 1885 and 1886 that was not found in 1887. The following are the species found in 1887 not found in previous years: Daucus Carota 8, Erigeron Canadense 2, Lobelia inflata 2, Malva rotundifolia 4, Sisymbrium officinale 1, and Silene noctiflora 1, all common weeds of roadsides and fields.

Of the thirty-three kinds of weeds mentioned in the table the following are especially pernicious and troublesome to field crops:

Weeds Especially Troublesome to Field Crops.

Red Root	Amarantus retroflexus L.
Ragweed	Ambrosia artemisiæfolia L.
Pigweed	Chenopodium album L.
Barn-yard grass	Panicum Crus-galli L.
Low Finger-grass	Panicum glabrum Gaud.
Lady's Thumb	Polygonum persicaria L.
Purslane	Portulaca oleracea L.
Foxtail grass	Setaria glauca B.
Pigeon grass	Setaria viridis B.

Could these nine kinds be banished from the country the warfare with weeds would be reduced one-half. Curiously enough, all of these but the ragweed are of foreign nativity, having emigrated to this country, and taken a more vigorous hold of the soil than the native plants. A few additional kinds are very obnoxious now and then because, while they do not spring up everywhere like those mentioned, yet when once established they are with much difficulty eradicated; such are Canada thistles, quack grass, milkweed, sorrel, burdock, and ox-eye daisy. Other kinds, like shepherd's purse, chickweed, and speedwell, are very common in rich garden soil, but are easily suppressed.

An answer to the query of what weeds and how many of a kind grow upon a definite area of cultivated soil was sought for in a different way. A square foot of surface soil, taken to a depth of three inches, December 11, from a plat (E 1 of the Station records) which had had clean culture, was transferred to the greenhouse. The same was done with soil from a plat (E 4 of the Station records) which had been allowed to run to weeds unchecked the previous season. Each was kept properly watered and remained undisturbed till the first of each succeeding month, when all germinations were counted and recorded, the plantlets removed, the ground thoroughly stirred (with one exception), and the soil again compacted, ready for the next month's growth. Soil was also taken from the same plats, in the same manner, only to one-half the depth, on April 14, and received like after treatment. The results of these trials are given in the accompanying table, in which the monocotyledonous plants, represented by the grasses, and the dicotyledonous plants, including all other sorts, are kept distinct.

Weeds in One Square Foot of Soil.

TIME OF COUNTING.	TAKEN FROM PLAT E, 1.				TAKEN FROM PLAT E, 4.			
	DECEMBER 11.		APRIL 14.		DECEMBER 11.		APRIL 14.	
	Grass.	Other weeds.	Grass.	Other weeds.	Grass.	Other weeds.	Grass.	Other weeds.
January	5	4	....	....	17	18	....	.....
February	3	2	....	....	11	66	....	.....
March	6	3	....	....	3	82	....	.....
April	7	13	....	....	1	35	....	.....
May	7	8	79	24	0	71	245	234
June	1	0	1	12	2	11	11	13
July	3	12	0	4	1	38	7	69
August	0	11	1	11	0	14	0	53
September	0	2	0	3	0	9	0	5
October	0	5	0	3	0	5	2	4
November	0	0	0	0	0	0	6	0
December	0	0	0	0	0	0	0	0

It is interesting to note that the soil which was longest exposed to the winter cold gave the largest number of germinations, although there was only half as much of it (exposing the same surface to the air, however). The grasses (mostly *Setaria glauca* and *viridis* apparently) also gave a larger yield, in proportion to the other weeds, in the soil longest out of doors. Increasing these figures to the basis of one-twentieth of an acre, in order to compare with the actual yield of weeds on such an area during one season, it will be found that the number is much greater than has been found by actual count, which indicates, probably, that in the open ground, within two or three inches of the surface, all the weeds do not find favorable conditions for germination during a single season.

The subject was also looked at from another point of view. Attempts have been repeatedly made at the Station to learn something of the germinating qualities of weed seeds—are all the seeds produced so lavishly by each plant really capable of germination? Our inquiries have always been cut short by finding that weed seeds gathered, preserved and tested in the same way that garden seeds are gave from none to seven or eight per cent of germination only, which was manifestly so greatly at variance with the truth, if one is to trust his daily observations, that some fault in the method was suspected.

Germination of Weed Seeds.

COMMON NAME.	LATIN NAME.	PERCENTAGE OF GERMINATIONS OF SEEDS GATHERED AT DIFFERENT DATES.		
		Sept., 1886.	Apr. 2, 1887.	June 8, 1887.
Wild Aster	Aster Novæ-Angliæ L.	3	....	.....
Beggar Ticks	Bidens frondosa L.	1	....	.....
Heal-all	Brunella vulgaris L.	0	....	.....
Shepherd's Purse	Capsella Bursa-pastoris M.	0	....	0
Pigweed	Chenopodium album L.	....	8	.....
Wild Carrot	Daucus Carota L.	73	0	.....
English Plantain	Plantago lanceolata L.	27	....	.....
Common Plantain	Plantago Rugelii Dec.	2	....	.....
Dandelion	Taraxacum officinale W.	....	....	92

The accompanying table gives the results of later studies. Seeds were gathered in September, 1886, and kept as garden seeds are till April of the following spring, then tested between folds of moist cloth in the germinating pans commonly used at the Station. Of one hundred seeds each of the wild aster, beggar's ticks, heal-all, shepherd's purse, common plantain, English plantain and wild carrot, only the last two gave more than three per cent of growth, those being twenty-seven and seventy-three per cent respectively. English plantain, also known as rib-grass, and called "buckhorn" by our workmen, is sometimes grown as a forage plant, and the wild carrot is the same species as the cultivated form and but little removed from it. Both might with some propriety be looked upon as escapes from cultivation; at least they have one property which adapts them to the routine of cultivated plants — the seeds can withstand dryness between the usual period of harvest and seed-time, apparently in proportion as their ancestry may be supposed to have been removed from wildness.

Seeds of pigweed and wild carrot were also gathered April second, from stalks that had remained over winter where they grew, and one hundred seeds of each, apparently sound and well developed, were tested in the germinating pans, being put in as soon as gathered. None of the carrot grew and only eight of the pigweed.

On June eighth, seeds of dandelion and shepherd's purse were gathered and at once put into the testing pans; not a seed of the latter germinated, but ninety-two per cent of the dandelion did, and a duplicate trial of dandelion seed in moist sand gave nearly the same percentage. So far as dandelion seeds are concerned it is evident that practically all the seeds which a plant produces are capable of growth.

Weeds seem well able to take care of themselves, but some of them, at least, do not appear to be well fitted for the ways of cultivated plants. If, indeed, it proves to be true upon further inquiry that some weed seeds are made incapable of germination by being kept dry for three or four months or so, it will be a comforting fact to know, as the danger of fouling land with those particular kind of weeds, by seeds conveyed in grain and garden seeds, will be shown to be much less than supposed.

SUMMARY.

The following summary will present the subjects which have been treated in the four annual reports, including the present one, made by the writer, to the New York Agricultural Experiment Station, in a more orderly connection. It also includes references to all other matter upon the same subjects, to be found in the several reports of the Station from the first (1882) up to and including the present one, properly accredited to the respective writers.

The first botanist's report (1884) begins with a short account of the rôle of parasitic and saprophytic fungi in plant diseases, general structure of fungi, and the use of fungicides.

Pear.— The most prominent subject of inquiry has been that of pear blight, or what is least used but the better name, fire blight. The report for 1884 goes over the ground of Professor Burrill's investigations, confirming his observations respecting the presence and activity of bacteria in connection with the disease, its infectious character as shown by inoculation, and the identity of pear blight and twig blight of the apple and quince. It was found that the disease could also be extended to various pomaceous fruits not tested by Professor Burrill, but could not be induced in plants of other orders. Inoculation in the green fruit, taking up an original line of research, was found more certain of results than in the branches, and this with other things led to the belief that succulency has to do with the fullest development of the disease. Reasons are given for thinking that the bacteria accompanying the disease are the cause of it. The probable manner of the propagation of the disease from tree to tree is outlined, and suggestions made as to remedies and preventions. In 1885 a rigid proof is given that the bacteria (*Micrococcus amylovorus* Bur.), which are always found accompanying the disease, are the actual cause of it. The discovery was made that the entrance of the bacteria into the tissues of the trees is effected through the center of the flowers and through the delicate growing tips of branches. An attempt was made to learn why some varieties suffer more from the disease than others, but with indifferent success. The mode by which the disease is normally propagated and spread is more

fully stated. Some facts are given about the development of the germs in artificial cultures, and the chemical and other changes which they bring about. In 1886 the proof of the bacterial nature of the disease is reviewed and further strengthened, the forms and transformations of the germs are described and illustrated, and the chemical changes they bring about further treated of, including the proof that they do not form a poison in the branches of the trees Statistics and experiments are produced to further show the relation of blight to succulency and to explain why the disease varies in different varieties of the same kind of fruit. It is further shown that the bacteria may live and propagate in common garden soil. An index of forty-three titles, with a short synopsis of each article, is provided to some of the chief opinions which have been expressed on the subject in various journals and reports, covering the time from 1794 to 1886.

The other diseases of the pear which have been treated of are the leaf blight, scab or rust, as it is severally called, due to the fungus Fusicladium pyrinum, with suggestions for its treatment, the blackening or browning of the leaves due to Morthiera Mespili, and the yellowing of the leaves due to want of sufficient nutrition, all in the report for 1884, with a note on scab, in the present report. There is also a note on the use of hyposulphite of soda as a preventive of scab by Mr. E. S. Goff in the 1886 report.

Apple.—The diseases of the apple that have been taken up are a brief account in the 1884 report of twig blight, already referred to above, and leaf blight or scab, due to Fusicladium dendriticum, and a note on the latter in the present report. Experiments in the use of hyposulphite of soda as a preventive of apple scab are given by Mr Goff in the reports for 1885, 1886 and the present year.

Quince.—Twig blight in quince, due to the same cause as pear blight, mildewed leaves caused by Podosphæra tridactyla, rotting of the fruit by Sphæropsis Cydoniæ, and spotting of the leaves by a variety of Morthiera Mespili, are all briefly treated in the report for 1884, no remedies being offered, and the last disease when attacking the fruit is described and illustrated in the report for 1885.

Peach.—A few remarks on peach yellows, and quite full accounts of curl and gumming or gummosis are given in the 1884 report. The opinions and researches of foreign investigators are cited and supplemented by experiments carried on at the Station. An additional item on the curl is given in the present report.

Plums and Cherries.—A full account and careful investigations on the common rotting of the fruit, found to be due to Oidium fructige-

num, are to be found in the 1885 report, with illustrations. In the 1886 report is an equally full account, based entirely upon new researches, of the cause of the premature dropping of the leaves. It is found to be due to the fungus known under the name of Septoria cerasina, the life history of which is traced out, excepting part of the details of one stage, which are supplied in the present report. The different parts of the fungus and the appearance of infected leaves are illustrated with cuts. Preventive and remedial treatment for the disease is suggested.

Potato.—The present report contains a description of the scab of potatoes, the structure in health and disease of the skin of the tuber, and an account of researches toward ascertaining the conditions favoring the disease and possible prevention, partly by Mr. M. H. Beckwith and partly by the writer. There is a suggestion regarding the active agent in potato rot at page 257 of the report for 1885, and statistics are given by Mr. E. S. Goff in the same report regarding the percentage of decay of tubers belonging to different varieties grown upon the Station grounds.

Tomato.—The rotting of ripe and green fruit is described and some of the fungi associated with the same are illustrated in the 1884 report. The subject is continued in the two succeeding reports, but no final conclusions are reached. Additional facts and observations are recorded by Mr. E. S. Goff in each report from 1882 to 1887 inclusive.

Lettuce.—In the 1885 report the mildewing or rotting of lettuce, due to Peronospora gangliformis, is described and illustrated; and in the same report a history and description of the rusting of the leaves by the fungus Septoria Lactucæ is given with illustrations.

Gooseberry.—The present report gives some account of the mildew of the gooseberry and a remedy for it.

Strawberry.—An account of the comparatively rare trouble with strawberries in this country, due to the mildew, Sphærotheca Castagnei, is found in the report for 1886.

Cucumber.—The harmful spotting of the green fruit by a Cladosporium is recorded by Mr. M. H. Beckwith in the present report, with a note by the writer.

Clematis.—The rotting away of the roots of clematis, causing a serious loss in the propagating house and among plants grown out of doors, was carefully investigated (1884) and found to be due to a fungus, the name of which was not determined.

Oats.—Exact statistics are given in the 1884 report showing the percentage of smut in oats as usually grown, and demonstrating that

there is much more loss from it than commonly supposed. Further statistics of the same nature are given by Mr. C. S. Plumb in the report for 1886, together with the results of treating the seed in various ways for the prevention of smutting, with valuable practical conclusions.

Weeds.— The number of weeds and the kinds growing upon one-twentieth of an acre of undisturbed soil in a cultivated field were carefully counted in 1885, 1886 and 1887. The number of seeds found to germinate in several samples of surface of soil taken from a cultivated field in winter and placed in the greenhouse are recorded in the present report. The amount of soil taken was a square foot to the depth of one and a half to three inches. The present year's report also contains the record of the germination of several kinds of weed seeds which received different preliminary care. These various statistics give occasion for some inferences of a practical character. The report for 1884 also has some account of several of the fungous parasites which infest weeds, and to some extent help to keep them in check.

Clover-leaf Weevil.— This insect, which has proved destructive to the clover crop in some places, was found to have its larvæ infested with a disease caused by a fungus new to science, Entomophthora Phytonomi. The fungus is fully described and illustrated in the report for 1885, except one form of spore germination, which is given in 1886. The effect of the disease upon the insect, its means of propagation and distribution are stated. A note in the present report shows that the fungus is an efficient check to the insect's multiplication.

Fungicides.— Beside the account of trials with sulphide of potassium in checking and preventing fungous diseases of plants, given in the present report, there are short notes about trials of other substances, and suggestions regarding still others, scattered through the several reports, for which the index is to be consulted. Mr. E. S. Goff has recorded the results obtained by use of hyposulphite of soda as a fungicide in the reports for this and the two preceding years.

Other Topics.— The present report also contains notes on the constancy of leaf characters in the dandelion when brought under cultivation, and on a form of apparatus for keeping a constant high temperature, together with further notes relating to all the reports of the Botanist, and an index to them.

PUBLICATION OF THE REPORTS FOR 1884–1887.

The report of the Station for 1884 (third), was published by the State from the press of Weed, Parsons & Co., Albany, N. Y., and

distributed in September, 1885. Excerpts of the botanist's part with special cover, but without change of paging, were distributed a week or two earlier in the same month. The report of 1885 (fourth) was published by the Station from the press of E. R. Andrews, Rochester, N. Y., and distributed in March, 1886. Excerpts with special cover and without change of paging were distributed January 30, 1886. The report was also published by the State from the press of Weed Parsons & Co., Albany, N. Y., and distributed in November, 1886. Excerpts from the latter are called the "second edition" on the special cover, and were distributed in December, 1886. They are separately paged, but have a table showing the corresponding paging in both the State and Station editions. The report for 1886 (fifth) was published by the Station from the press of the Advertiser Association, Elmira, N. Y., and distributed in February, 1887. Excerpts with special cover and without change of paging were distributed January 30, 1887. This excerpt has an unfortunate typographical error on the cover, making the year of the report read "1887," instead of 1886. The 1886 report was printed for the State by the Argus Company, Albany, N. Y., and distributed October, 1887. The excerpts from the State or "second" edition, with special cover and without change of paging, were distributed October 15, 1887. This excerpt includes part of Mr. C. S. Plumb's report of "smut in oats," and Mr. E. S. Goff's report on "hyposulphite of soda as a fungicide," and also has a prefatory note.

INDEX TO BOTANIST'S REPORTS FOR 1884, 1885, 1886 AND 1887.

The Roman numerals refer to the volume, the Arabic to the page. The volumes I to IV correspond to the years 1882 to 1887. From 1882 to 1884 inclusive, only one edition of the reports was published. The reference to reports issued since 1884, are to the editions published by the Station. The page for the State edition of 1885 can be ascertained by adding 27 to the given page of the Station edition of that year. References to the writings of Mr. C. S. Plumb, Mr. E. S. Goff and Mr. M. H. Beckwith, relating to plant diseases, are inclosed in brackets.

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REPORT OF THE CHEMIST.*

This report deals chiefly with the composition and general properties of butter, especially as affected by breed or individuality of cow, and to some extent by food; a discussion of lysimeter results, and a record of sunshine for the year.

EXAMINATION OF BUTTERS FROM THE NEW YORK DAIRY SHOW.

The sweepstake prizes offered at the New York Dairy and Cattle Show, held at Madison Square Garden in May last, for the cow producing the greatest quantity of milk during twenty-four consecutive hours of the exhibition, and the cow producing the greatest quantity of butter during the same time, were competed for by representatives of the Holstein, Jersey and Guernsey breeds. The cows competing for these prizes were thirteen in number, there being seven Holsteins, five Jerseys and one Guernsey. The following list gives the name, owner and breed of cow together with the yield of each.

The cows Nos. 5, 7 and 8 competed for the milk prize only. The Nos. 3, 6, 9, 10, 11, 12 and 13 for the butter prize only; the others competed for both milk and butter prizes:

*S. M. Babcock.

No,	NAME OF COW.	Owner.	Breed.	Weight of milk.	Weight of butter.
1	Clothilde, 1308 H. H. B., 8 years old	Smiths, Powell & Lamb	Holstein	63 lbs. 1½ ozs.	2 lbs. 7½ ozs.
2	Lady Fay, 4470 H. H. B., 8 years old	Smiths, Powell & Lamb	Holstein	65 " 13½ "	1 " 10¼ "
3	Clothilde 4th, 3480 H. H. B., 4 years old	Smiths, Powell & Lamb	Holstein	58 " 10 "	2 " ¼ "
4	Mechtchilde, 6718 H. H. B., 4 years old	F. C. Stevens	Holstein	64 " 15 "	1 " 14 "
5	Jewel, 668 H. H. B., 9 years old	F. C. Stevens	Holstein	59 " 15½ "	.. " .. "
6	Movike 3d, 1540 H. H. B., 7 years old	James Nielson	Holstein	27 " 3 "	1 " 2¾ "
7	Ekster 2d, 1543 H. H. B., 6 years old	James Nielson	Holstein	45 " 9½ "	.. " .. "
8	Shonemunk Maid, 12578 A. J. C. C., 6½ years old	Oscar Ricklefsen	Jersey	26 " 9½ "	.. " .. "
9	Water Lily, 11797 A. J. C. C., 6 years old	Oscar Ricklefsen	Jersey	23 " 2 "	.. " 14½ "
10	Island Chrissie, 12007 A. J. C. C., 8 years old	Green Mountain Stock Farm	Jersey	27 " 11 "	1 " 8¾ "
11	Gold Lace, 10726 A. J. C. C., 11 years old	Green Mountain Stock Farm	Jersey	33 " 13 "	1 " 14¾ "
12	Hilda A. 3d, 16636 A. J. C. C., 6 years old	F. Bronson	Jersey	31 " ½ "	1 " 9¾ "
13	Jessie of Lester Manor, 740, 9 years old	Francis Shaw	Guernsey	40 " 3 "	1 " 14½ "

The milk prize was awarded to Lady Fay, she having given 65 lbs. 13½ oz. of milk, and the butter prize to Clothilde, with a yield of 2 lbs. 7½ oz. of butter. The average amount of milk given by the six cows competing for the milk prize was 54 lbs. 5½ oz. The average for the five Holsteins was 59 lbs. 14 oz.

The average yield of butter for the ten cows competing for the butter prize was 1 lb. 11¾ oz. The average for the five Holsteins was 1 lb. 13.6 oz., and for the four Jerseys 1 lb. 7.9 oz. The yield of the single Guernsey entered was 1 lb. 14½ oz.

The pounds of milk required for one pound of butter in each case were,

Holstein.		*Jersey.*	
Clothilde	25.55	Water Lily	25.52
Lady Fay	40.13	Island Chrissie	17.90
Mechtchilde	34.63	Gold Lace	17.73
Clothilde 4th	29.08	Hilda A. 3rd	19.28
Movike	23.20		
Average	30.52		20.11

Guernsey.

Jessie of Lester Manor, 21.01.

Average for all, 25.4 lbs. milk for one pound of butter.

Considering that these cows were in a strange place and for most of the time during the test were surrounded by a crowd of strangers, the yields are remarkable.

We were prepared, and earnestly desired to analyze both the milk and butter of the cows competing for these prizes, but it was not possible to obtain samples of the milk, and this most essential part of a test of this kind was necessarily abandoned. Analyses of the test butters from each of the cows competing are given below:

	NAME OF COW.	Yield of butter.	Analysis of Butter.			Fat in total butter.
			Water.	Fat.	Curd by dif.	
		Lbs. Ozs.	Per cent.	Per cent.	Per cent.	Ounces.
1	Clothilde	2 7½	21.06	77.55	1.39	30.63
2	Clothilde IV	2 1	17.82	81.51	.67	26.29
3	Gold Lace	1 14½	14.55	84.52	.93	25.78
4	Jessie of Lester Manor	1 14½	15.23	84.05	.72	25.64
5	Mechtchilde	1 14	22.19	76.75	1.06	23.02
6	Lady Fay	1 10¼	17.01	81.98	1.01	21.52
7	Island Chrissie	1 8¾	15.43	83.65	.92	20.70
8	Hilda A. III	1 9¾	20.80	78.33	.87	20.17
9	Movike	1 2¾	16.45	82.98	.57	15.56
10	Water Lily	14½	17.14	82.20	.66	11.92

The total amount of fat in the butter, as shown by these figures, justifies the award of the prize. It is evident, however, from the variable amount of water in the butters, that had the yield been more nearly equal, this would not have been the case. Obviously the only true basis for a test of this kind is the amount of fat which the butter contains, and I trust that the time is not distant when no butter test will be accepted unless accompanied by an analysis of the butter made. I would go still further, and analyze the milk given, as this, in connection with the analysis of the butter produced, would be the best guarantee against fraud, and would render unnecessary the locks and seals with which such tests are at present encumbered. With the adoption of this plan each person can manage his milk as he chooses, knowing that any addition of fat to the milk or cream would be sure of detection. It would also prevent the suspicions which are often expressed, and I believe too often justly, that notable records are obtained by weighing undue quantities of water and curd as butter.

Besides the individual butter from the cows entered for the sweepstake prize, fourteen samples of the exhibition butters, including several of the prize packages, were obtained for analysis. These samples, coming from all parts of the country, should fairly represent the composition of prime American butter. The analyses are presented below:

NUMBER.	Water, per cent.	Fat, per cent.	Ash (salt), per cent.	Curd by dif., per cent.
1	9.32	87.32	2.34	1.02
2	11.91	85.03	2.17	.89
3	11.57	86.98	.96	.49
4	11.81	86.30	1.16	.63
5	9.76	86.99	2.31	.94
6	11.00	84.39	4.23	.38
7	10.50	86.87	2.29	.34
8	9.90	87.79	1.74	.57
9	11.80	85.32	2.42	.46
10	10.31	87.03	2.24	.42
11	9.26	87.57	2.21	.96
12	10.69	87.87	1.06	.38
13	10.47	87.55	1.46	.52
14	13.16	83.19	3.29	.36
Average	10.82	86.44	2.13	.60
Highest	13.16	87.87	4.23	1.02
Lowest	9.26	83.19	.96	.34

In addition to the ordinary analyses of these butters, which are given above, the filtered fat from each of them has been subjected to several of the tests that have been proposed by chemists for the detection of adulterations. These tests are especially interesting, as

each of them depends upon some peculiarity of the butter, and in a measure indicates its composition.

The tests made have been the volatile fatty acids by Reichert's method, the saturation equivalent by Koettstorfer's method, the iodine number as proposed by Hubl, the melting point of the butter fats and the viscosity of aqueous solutions of the potash soaps, as described in the report of the New York Agricultural Experiment Station for 1886. The results obtained are presented in the accompanying table, the butters being arranged according to breed of cow so far as this was known:

	Number.	Reichert's test—N-10 Na O H.	Hubl's test—Iodine number.	Koettstorfer's test—Milligrams of K O H for 1 gm. of fat.	Melting point.	Viscosity of soap solutions.
Jersey butters	1...	16.1	34.5	227.5	32.7	103
	2...	14.1	30.5	227.1	35.3	54
	3...	13.2	35.3	229.8	33.7	71
	4*..	14.1	32.6	231.1	33.8	81
	5*..	11.5	35.6	223.1	33.2	97
	6*..	13.2	25.9	232.5	35.4	50
	7*..	14.4	23.8	232.2	34.0	65
Average	....	13.8	31.2	229.0	34.0	74
Holstein butters	8...	16.1	41.4	224.0	34.6	297
	9...	12.5	41.0	220.5	34.9	256
	10*..	14.4	44.7	224.3	32.1	461
	11*..	14.1	40.1	226.8	32.4	179
	12*..	13.9	42.2	227.6	30.5	187
	13*..	12.1	34.6	222.7	36.9	166
	14*..	16.0	36.1	229.4	32.4	112
Average	....	14.1	40.0	225.0	33.4	237
Guernsey butters	15...	15.6	36.9	227.2	33.5	153
Ayrshire butter	16*..	14.3	33.9	232.0	33.0	68
	17*..	13.9	37.8	232.3	33.5	66
Breed unknown	18...	13.3	35.4	227.8	33.5	71
	19...	12.9	41.2	222.3	33.0	208
	20...	13.9	33.3	227.2	34.6	65
	21...	14.1	33.8	227.8	33.5	65
	22...	14.2	32.8	228.0	35.0	100
	23...	13.4	33.3	228.5	34.4	88
	24...	13.5	39.2	224.8	33.2	103
	25...	14.1	31.9	228.0	35.0	62
	26...	13.9	37.8	232.3	33.5	66
Average	....	13.9	35.6	228.2	33.8	93
Average for 26 samples	....	13.95	35.6	227.5	33.7	127

*Butters from the milk of single cows.

I shall consider the relation which the figures given by these tests bear to the chemical composition of the butter fats; the difference in the composition indicated which may be attributed to breed and to individuality of cow, and finally the bearing which these variations have upon butter standards and the detection of adulterations.

I. VOLATILE FATTY ACIDS — REICHERT'S TEST.

The principal distinction between butter and other fats is found in the presence in butter of a considerable amount of glycerides of volatile fatty acids. The acids of this class which have been identified are butyric, capric, caproic, and caprylic; of these the first largely predominates and it is customary to consider all of the volatile acids as butyric. Reichert's test depends upon the amount of these volatile fatty acids which are obtained in a specified manner from 2.5 gms. of fat. It is expressed by the numbers of cubic centimeters of decinormal alkali required to neutralize this acid. The alkali required is not an equivalent for the total volatile acid of the butter, although it appears to have quite a uniform ratio to them. Waller's results show that the figures obtained by Reichert's test represented about 80 per cent of the total volatile acids expressed as butyric. (N. Y. Dairy Commissioner's report, 1886, p. 240.)

While these butters differ widely in the amount of volatile acids, there seem to be no differences which can be attributed to breed; the average and extreme figures for the Jerseys, Holsteins and others being nearly the same. The extreme variation is from 11.5 c. c. to 16.1 c. c., the average for all determinations being 13.95 c. c. Reichert gave the mean value as 14 c. c., the lowest limit for pure butter being placed at 12.5 c. c. All of these samples except Nos. 5 and 15 fall within these limits. These butters, so exceptionally low in volatile fatty acids, were tested several times and always with practically the same results. These low results cannot be attributed to breed and are probably not due to food, as the dairy butter No. 2, which is above the average, is from the herd to which the single cow No. 5 belonged. The only other case in which figures so low as these have been obtained, from butter known to be pure, is mentioned by Cornwall and Wallace (Zeit. Ann. Chem., Heft 3, 1887), who found in a sample of butter made from milk of a grade Alderney 11.3 c. c.–11. 5 c. c. These tests extended over a period of several weeks and were repeated many times by each of the investigators. This exceptionally low figure could neither have been due to breed nor to food, as this cow belonged to a herd of eight of the same breed, all receiving the same care, the remaining cows of the herd ranging from 12.2 c. c. to 15.1 c. c.

Reichert's method has been quite generally adopted by chemists for the detection of adulteration, and for this purpose is probably the most satisfactory that has been proposed. It appears, however, from figures given above, and others which might be cited, that the lower limit adopted is too high. Certain it is that some pure butters, and especially those from single cows, may fall considerably below 12.5 c. c.

2. Iodine Number.

Oleic is the only fatty acid found in the glycerides of butter fat which has the property of absorbing iodine. Each molecule of this acid absorbs one molecule of iodine, so that the per cent of iodine absorbed is directly proportional to the per cent of olein present. The variation of this number, especially in the butters from single cows, is very great, showing the per cent of olein to vary in these butters from 27.7 to 52.1. There is also a very decided difference between the Holstein and other breeds, the average for the Holstein being olein 46.19, that for the other cows tested being 35.4 per cent. The average for 26 samples of butter, including that from single cows and dairies, has been olein 41.5 per cent. This high per cent of olein in Holstein butter will account for its softness as compared with Jersey butter.

The wide range in the iodine number shows olein without doubt to be the most variable constituent of butter. This, in connection with the variation due to breed, is sufficient to render the test useless for the detection of adulterations. It is, however, of value as an indication of the composition of butter.

3. Saturation Equivalent — Koettstorfer's Method.

The volatile fatty acids of butter have a much lower molecular weight than stearic, oleic or palmitic; consequently butter requires more alkali for saponification than fats which contain only the latter acids. Thus lard, tallow and the oils used as adulterants, all require less than 200 milligrams of potassium hydrate for each gram of fat, while butter requires from 220 – 232 milligrams.

By comparing the figures for the above butters we find that the Holstein butters quite uniformly require less potassium hydrate for saponification than do the Jersey butters. This, taken by itself, indicates that the Jersey butters contain a larger proportion of volatile fatty acids than the Holstein. Reichert's test, however, does not confirm this. It seems, therefore, that the insoluble fatty acids of Holstein butter must consist on the average of fatty acids of higher molecular weight than Jersey butter. In other words, if the insoluble

fatty acids of butter are a mixture of oleic, stearic and palmitic, the proportion of oleic and stearic acids must be larger in Holstein than in Jersey butter.

Blythe gives the percentage of the different glycerides of butter as follows:

Olein	42.2
Stearine and palmitine	50.0
Butyrine	7.8

If we consider the stearine and palmitine as present in equal quantities, the milligrams of potassium hydrate required for saponifying 1 gm. of this typical butter would be 222.8. This is considerably less than the average obtained from pure butters. Assuming stearine as absent and replaced entirely by palmitine there would be required only 227.6 mgr. potassium hydrate for 1 gm. of fat. This is about the average for butter and is considerably less than the highest limit found. This would indicate either that the olein of butter has been overestimated, or that there is present in butter glycerides of other fatty acids of lower molecular weight than those which have been mentioned, or that stearine in most butters is absent. The iodine numbers for the 26 butters in the tables show an average per cent of olein 41.5, or very nearly that mentioned by Blythe.

If we assume that in Reichert's method 75 per cent of the volatile fatty acids are recovered, we have a means for calculating approximately the composition of these butters. The iodine number gives data for obtaining the olein, so that there is left the stearine and palmatine to neutralize the remainder of the potassium hydrate required for saponification. An attempt to apportion the K O H remaining between stearine and palmatine, shows that in many of these butters the potash is in excess even if stearine is absent. This indicates that either stearine is present in small quantity or that insoluble acids of lower molecular weight than palmatic are present in considerable quantity.

4. Melting Points.

The melting points given for these butters were determined in the manner proposed by Wiley, by means of disks of fat suspended in a mixture of alcohol and water and noting the temperature when the disks assume a spherical form. Wiley says (Bulletin of Dept. of Agriculture No 13, p. 49): "The mean melting point of the butters examined is 33.8° C., the maximum is 34.7° C, and the minimum 32.6° C. In general terms, it may be said that a genuine butter will show a melting point falling within the limits of 33 C. and 34 C." Although the aver-

age found in the above butters is nearly the same as the mean given by Wiley, being 33.7° C., the extremes are much wider, viz., from 30.5 C. to 36.9° C. This, however, is only true of the butters from single cows, as the butters from herds fall nearly within his limits, the average being 34 C., ranging from 32.7 C. to 35.3 C.

These results vary greatly in the butter from individual cows, but are not sufficiently marked between the breeds to show that variation may be attributed to this cause. They are, however, sufficient to render this determination useless for the detection of adulteration. Although the Holstein butters are much softer than the Jersey butters when exposed to warmth, they do not appear to become liquid at a perceptibly lower temperature.

5. Viscosity of Solutions of Butter Soaps.

Aqueous solutions containing 4 or 5 per cent of potash soaps become, when rendered slightly alkaline with potassium hydrate, quite viscous, and when the amount of free alkali is considerable, are completely gelatinized. Each of the fatty acids, stearic, oleic, etc., which enter into the composition of fats and oils, forms with potash a soap whose aqueous solution has a definite coëfficient of viscosity. Solutions of these soaps behave differently with potash, stearic and oleic acid forming soaps whose solutions are more easily gelatinized than the soaps of other fatty acids found in ordinary fats and oils. It follows that solutions of soap with a definite amount of potash from different fats will be more viscous in proportion as these acids predominate in the fats used. The salts of the volatile fatty acids are but little influenced by potash. This is also true of palmitic and the other acids of butter except oleic and stearic. It is evident, therefore, that the determination of viscosity of soap solutions, made under the same conditions, furnishes a means of discriminating between different fats and oils. Especially is this true when applied to butter and its substitutes, as those fats used for the adulteration of butter are composed almost entirely of glycerides of stearic and oleic acid. A soap made from 15 grams of stearic or oleic acid, with 10 gms. of potassium hydrate, dissolved in water and made up to 500 cc., will form at 20° C. a very viscous solution; it is indeed almost a jelly. Lard, tallow, cottonseed or olive oil and all of the common fats and oils act in a similar way. The same is true of butterine, oleomargarine and all of the commercial substitutes of butter. Butter, on the contrary, when treated in this way, gives a limpid solution, the viscosity of which is very slight. Butters, however, on account of the variation in the amount of volatile acids and olein, have a very wide range, so that

small quantities of foreign fats when mixed with butter may not be detected. The volatile fatty acids of butter tend in two ways to reduce the viscosities of its soap solutions. First through their low coëfficient of viscosity, and second through their comparatively high neutralizing power, which leaves less alkali in solution.

The tests of the Dairy Show butters show these variations in a most satisfactory manner. They indicate clearly breed peculiarities and variation in the composition of butter from single cows not shown by other methods. The viscosities given are expressed by the number of grams of cane sugar, which, dissolved in water and made up to 1 litre, give solutions having the same viscosity as the liquid under examination. The thoroughbred Holstein butters, 7 in number, have an average viscosity of 237, ranging from 112 to 461. Seven thoroughbred Jersey butters averaged 74, ranging from 50 to 103. Of other thoroughbred butters, the Guernseys are represented by two and the Ayrshires by one sample. These are insufficient to show breed peculiarities which may exist, and are classed with those from grades and unknown sources. The average viscosity of these unknown butters is 93, ranging from 65 to 208.

The general average for all of these butters is 127, ranging from 50 to 461. This average, however, owing to the large number of Holstein butters, is too high. The average for commercial butters throughout the country will probably not exceed 100.

An inspection of the figures shows the viscosities to vary quite uniformly with the iodine numbers, or, in other words, with the percentage of olein which the butters contain. Tests with commercial oleic acid, probably not pure, show that the quantity of oleic acid found in butter by the absorption of iodine, when saponified and dissolved in water containing the same amount of free alkali as the butter soap solutions, will have nearly the same viscosity as those solutions. This indicates that stearic acid is either entirely absent in butter, or present in very small quantities ; and fully confirms, in an independent manner, the conclusions reached by comparison of the saturation equivalents of different butters. It is of course possible that the volatile and other fatty acids of butter having a low molecular weight may modify the viscosities due to oleic and stearic acids, thus rendering the coëfficients of viscosity of these acids, taken together, less than they would be if alone. This, however, is not probable, as a mixture of the fatty acids of butter, so far as they could be obtained, and glycerine, in the proportions given by Blythe as existing in butter, when saponified, gave a solution whose viscosity was too great to be measured by the apparatus, as arranged for butter.

For the detection of adulterations in butter, and probably in other fats, the determination of viscosity of the soap solutions is a rapid method, easy of manipulation, and as efficient as any of the chemical methods in general use. The range in the butters from single cows appears much greater than that shown by other methods. This difference, however, means no more in per cent of adulteration than do the smaller differences shown by Reichert's or Koettstorfer's method; for all of the commercial adulterations, such as oleomargarine or butterine, which rarely contain less than fifty per cent of adulteration, the results are never doubtful. In any known sample of butter the addition of one per cent of lard, oleomargarine or cottonseed oil is easily detected. The readiness with which slight changes in the composition of butter may be shown renders this examination of value in feeding experiments, for determining the effect of foods upon the butter fats.

CONCLUSIONS.

The variations in the composition of butter, as shown by these examinations, are much greater than has been generally supposed, and occur not only in the amount of volatile fatty acids, but affect all of the constituents of the butter.

These variations are especially marked in those butters made from the milk of single cows, where the extreme values are so widely separated as to render doubtful the detection of even thirty per cent of adulteration by means of any single test. It is, however, unlikely that a pure butter will be found deficient in all respects, so that in doubtful cases the application of as many tests as possible is advisable.

The influence of breed of cow upon the composition of the butter fat is no less marked than it is upon the composition of the milk, and, contrary to general acceptation, does not appear to be materially affected by the character of the food.

The amount of stearine in butter has been largely over-estimated; instead of thirty to forty per cent it is probably less than three per cent in most butters. It is only on this supposition that the high saturation equivalent of butter fat, and the low viscosity of solutions of its soaps, can be explained.

THE USE OF THE VISCOMETER.

The experience of another year with the viscometer has confirmed my impressions, given in the last annual report, concerning its value as an aid in the study of butter and other fats. For the detection of adulterations in fats and oils, the method proposed is as reliable as any of the chemical methods in general use, and has the advantage

over most of them that it requires comparatively little time. As some slight changes have been made in the manner of conducting the test, the method as applied to the examination of butter is described in full.

Fifteen grams of the filtered butter fat are weighed into a beaker of about 500 cc. capacity, and 10 cc. of a solution of potassium hydrate (1 cc. = 0.5 gm. K O H), and 10 cc. of 95 per cent alcohol added. The beaker is placed upon a water bath and heated, the contents being occasionally stirred, until saponification is complete and the alcohol evaporated. About 300 cc. of water are then added and warmed until the soap is completely dissolved, the beaker meanwhile being covered to prevent the formation of a film over the surface of the liquid. When the solution is clear, 10 cc. more of the potassium hydrate solution are added, the beaker being left upon the water bath till the precipitate which forms is dissolved. The same results will be attained by adding 20 cc. of the potassium hydrate solution at once to the fat before saponification, but in this case the soap formed will be difficultly soluble and considerable more time will be required in making the solution. The soap solution is transferred to a 500 cc. flask, which is then filled to the mark with water. The solution is cooled to 20 C., the volume accurately adjusted to 500 cc. and its viscosity determined.

When treated in this way each of the fatty acids, stearic, oleic, palmitic, etc., which enter into the composition of fats and oils, forms a soap, the solution of which has a definite coëfficient of viscosity. Moreover, this coëfficient of viscosity is increased in a manner peculiar to each of these acids by the addition of alkali to the soap solutions. It follows that any changes in the composition of the natural fats and oils will be indicated, either by changes in the viscosity of the soap solutions or by the effect produced by the addition of definite quantities of alkili (K O H). The soaps from fatty acids of high molecular weight, as stearic and oleic, have a high coëfficient of viscosity, while those from acids of low molecular weight, as butyric and caproic, have low coëfficients of viscosity. This is partially due to the difference in the neutralizing power of the acids, the soap solutions from acids of high molecular weight being more alkaline than the others, but this only accounts for a part of the difference, as even when the solutions are made to contain the same amount of free alkali a marked difference still exists. As a considerable portion of the fatty acids of butter have a low molecular weight, the viscosity of its soap solution is low when compared to that from the fats and oils which are used for its adulteration. For instance, the average viscosity of solutions of soaps from

butter fat is about 100; that of lard, tallow, oleomargarine oil and all of the commercial substitutes for butter are upwards of 1,000, so that this test is amply sufficient for this discrimination. Butters, however, vary greatly in composition, and consequently there is a wide range of viscosity for the solutions of butter soaps. This range is so great that over 30 per cent of adulteration may be added to the butter giving the least viscous soap solution before the higher limit for butter is passed. This at first seems sufficient to condemn the method, but an examination of the tests for adulteration, which are generally accepted by chemists, shows them to be no more reliable than the test proposed, while most of them are more complicated and difficult of manipulation. I give below extreme figures which I have myself found by Reichert's and Koettstorfer's test, and in connection with them the amount of lard of average composition which must be added to the butter giving the highest figure to reduce it to the lowest:

	Maximum.	Minimum.	Per cent of lard necessary to reduce max. to min.
Reichert	17	11.3	33.6
Koettstorfer	233	220	34.2

The methods mentioned in this table are the ones most generally employed by chemists for the detection of adulterations. I believe, therefore, that the viscosity test is fully as reliable for this purpose as any which has been proposed.

The real difficulty lies not in any of the proposed tests, but in the variable composition of butter, that from different breeds, and even from single cows of the same breed, having very different properties. It is not probable that the butter from herds and creameries where the milk of a large number of cows is received, would give figures by any of the above tests which differ much from the average. Still the possibility always exists that a sample of butter which gives the minimum test may or may not be pure, and I believe that no single test is competent to discriminate absolutely between some pure butters and others which contain as much as 30 per cent of adulteration. On this ground I would urge upon chemists the necessity of applying as many tests as are available in all cases where doubtful figures are obtained. The tests which I would recommend for the detection of adulteration

are first, on account of the economy of time and ease of manipulation, the viscosity test as described above, and second, Reichert's test.

The combination of these two tests, depending as they do upon entirely different properties of the fats, will in nearly all cases be sufficient. Should the viscosity exceed 500 there is no doubt of its adulteration, and no further test need be made. Butters giving viscosities between 200 and 500 are doubtful and should be submitted to further examination.

It is probable that the viscosity of soap solutions from butter diminish with age. Seven samples of butter tested in May, shortly after churning, were tested again in October with the results given below. These butters were filtered at the time of first test and kept in corked bottles until tested again; they were at this time slightly bleached, but were otherwise unchanged in appearance.

Viscosity in May ..... 65, 69, 62, 61, 69, 68, 65; average 65.6
Viscosity in October..... 54, 62, 62, 58, 53, 62, 54; average 57.9

In the last report I have recommended the determination of viscosity as a rapid and efficient means for detecting changes in the composition of milk which may occur from day to day, and have suggested that it might, to some extent, replace analyses of milk during feeding experiments. The data obtained at that time seemed to warrant this conclusion. Later tests, however, in the same series, showed that changes in the milk may be of such a nature as to cause no change in its viscosity. This is shown in the following determinations where milks having the same viscosity differ considerably in composition:

Viscosity	288	Fat	5.74
Viscosity	288	Fat	5.62
Viscosity	288	Fat	4.71
Viscosity	273	Fat	5.55
Viscosity	273	Fat	4.89
Viscosity	266	Fat	4.85
Viscosity	266	Fat	4.42

It is evident, therefore, that the test does not accomplish all that I hoped it would one year ago. Still it has a value, especially when accompanied by analyses, as it will indicate changes in the physical constitution of milk which are often of more importance to the dairyman than are changes in the amount of solids or of fat. Changes in the size of the fat globules or in the viscosity of the milk serum are of this

nature and are not indicated by chemical analysis. A low viscosity of the milk serum, accompanied by large fat globules, supplies favorable conditions for the economical production of butter. As the coëfficient of viscosity for the fat of milk increases with the size of the globules, it follows that the greater the difference between the viscosity of the whole milk and that of the skim-milk the more valuable will the milk be for butter, provided, of course, that the viscosity of the skim-milk is not very high.

When warm milk is run through a centrifugal, the skim-milk and cream being caught in the same vessel and thoroughly mixed, the product is less viscous than the original milk. This appears to be chiefly due to the breaking up of the fat globules. The extent to which this division takes place is shown by the following determination of the number of globules before and after separation:

	Viscosity.	Number of globules in .0001 c. m. m.	Per cent of globules with diameter less than one division of micrometer.
Milk	267	149	52.7
After separation	248	201	60.3
After second separation	249	174	70.0

The second separation was effected at too low a temperature and resulted in partially churning the cream. Under the microscope many of the fat globules appeared distorted and adhered to each other; this partially accounts for the smaller number of globules and increased viscosity found after this separation. Although the per cent of small globules after the second separation is considerably increased, their number remains almost exactly the same as before, showing that in the process of churning the large globules are the ones which first unite to form granules of butter.

The effect which this division of the fat globules has upon the quantity and quality of butter made from centrifugal cream is at present uncertain, no direct tests having been made. This peculiarity, however, may explain why the same manipulation which produces high-grade butter from ordinary cream often fails when applied to centrifugal cream.

The hypothesis that the butter fats are derived directly from the food, and are transferred without change to the milk, as advanced by

Professor Arnold,* has received considerable attention, and is worthy of careful investigation, as its confirmation would enable the dairyman to control, through the food, the quality and composition of the butter produced. There is asserted evidence that such a transfer takes place in the well-established fact that certain plants, as onions, turnips, etc., when fed to milch cows, impart, in a short time, their characteristic odors to the milk. The marked difference not only in color but in flavor of butter made during the winter, when the cows receive only dry food, and in the summer, when in pasture, has been attributed to differences in the fatty portions of the fodder.

On the other hand, the variations in the composition of butter to be ascribed to breed, and to individual peculiarities of the cow, are so well defined and so constant in character, whatever the character of the food given, as to render a direct transfer of fats highly improbable. That the essential oils of plants may to a small extent be transferred to the milk without decomposition, need not be here questioned. These principles, however, being volatile and somewhat soluble, should be more readily assimilated than the insoluble fixed oils such as comprise a large proportion of butter fats. Moreover, the proportion of these essential oils of the food which finds its way into the milk is very small. A peck of onions fed to a cow would scarcely impart so much flavor to the milk as would a small piece added directly to it.

One way of solving this question is by careful examinations of the butter and noting the changes in composition which follow radical changes in the food. Crude cottonseed oil has some characteristic properties by which its presence, when mixed with butter, even in small quantities, may be detected. This fact suggested the experiment of feeding cottonseed meal, which contains a high percentage of oil, and which is generally conceded to have a decided influence upon the character of the butter, to a cow, and examining the butter for the peculiar properties of cottonseed oil. This test was made with one of the Station cows, the butter from which had been previously and frequently tested in the laboratory.

The first cottonseed meal was fed April eighteenth, one-half pound being given. This quantity was gradually increased until May first, when four pounds were fed each day. This amount of meal contained as much fat as the remainder of the ration, and would, therefore, be expected to contribute an appreciable amount of cottonseed oil to the butter, if any direct transfer occurred.

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* Paper read at the meeting of the Society for the Promotion of Agricultural Science at Montreal.

The tests applied to the butter were viscosity of its soap solutions and its behavior when mixed with subacetate of lead. The first of these tests is very sensitive to changes in the composition of butter fat. Moreover the soaps from crude cottonseed oil have a high viscosity, while those from butter fat are usually low.

The butter from the cow experimented with was tested February 25; April 18, 22, 26, 28; May 4, 8, 16, and October 21, with the following results :

Date	Feb. 25.	April 18.	April 22.	April 26.	
Viscosity	65	69	62	73	
Date	April 28.	May 4.	May 8.	May 16.	Oct. 21.
Viscosity	61	69	68	65	68

Feb. 25, when the first test was made, the cow was being fed ensilage, with some hay and corn meal. For two weeks preceding April 18 she was fed hay with corn meal and wheat bran. From this time until into May she received hay with a gradually increasing quantity of cottonseed meal. The uniformity of this test, before, during and after the experiment, shows that very little change in the composition of the butter had occurred under decided changes in the character of the ration, and is strong evidence that no cottonseed oil was transferred to the butter. This will be more apparent when it is considered that the viscosity of soap solutions from butter of different cows under normal conditions has varied from 50 to over 400.

When cottonseed oil is thoroughly mixed with a strong solution of basic acetate of lead, and allowed to stand for some time, it changes to a peculiar brownish red color.* This reaction is said to be characteristic of this oil and serves to detect it when mixed with other fat. Pure butter fat treated in this way remains unchanged in color, but the addition of a small quantity of cottonseed oil causes it to assume a yellow, and if a large quantity is present a brown color. None of the butters made from this cow at any time, whatever her feed, were affected by this test.

The negative results of these two tests show beyond question that, in this case at least, there was no transfer of cottonseed oil from the food to the milk. The same thing is shown by the constant and uniform difference found in butters from different breeds of cows and from individual cows in the same herd, all receiving the same food and care. These considerations and the general impressions of all of my work with butter have led me to believe that the composition of the

* Zeit. fur Chem., XXII, p. 618.

butter fats are practically constant for each individual cow under all circumstances of normal feeding.

Must we then conclude that neither care of cow nor food can influence the quality of butter? Not at all; quality of butter depends more upon certain physical properties and flavors, which comprise scarcely more than traces of the butter, and which as yet have not even been identified by chemists, than upon the fixed oils which compose it. These principles, and also those which determine the color of butter, are unquestionably influenced by food and treatment. I believe, however, that the first and most essential requisite in the manufacture of good butter is a butter cow. Without this one factor, success is impossible; with it and a skilled dairyman, success is certain and practically independent of the character of the ration fed, if sufficient nutriment is supplied.

LYSIMETER.

Each year since the establishment of this Station, in 1882, records have been presented in the annual reports, of the monthly drainage water from each of the three lysimeters and of the chemical examinations made. Discussion of results has been deferred, hoping that sufficient data would reconcile the discrepancies which exist between the lysimeter results and what apparently takes place in outside soils. Increased data has not done this, and I am inclined to believe that no analogy exists by which evaporation, drainage and consequent loss of fertility in natural soils can be determined by lysimeters constructed in the ordinary way.*

Before discussing our lysimeter results and the causes which are believed to render them unsatisfactory, I wish to consider the evaporation which takes place from large areas under natural conditions. For this purpose I assume that the difference between the rainfall upon a given water-shed, for a series of years, and the water which is discharged by the drainage streams, represents the evaporation. Unfortunately, there are but few water-sheds which have been studied with sufficient accuracy to be available for this purpose, but the discharge of streams which are depended upon for the water supply of cities have been quite closely determined.

The data given in the following table are compiled from the reports of the Boston Water Board and from the Tenth Census of the United States, Vol. XVI:

*See N. Y. Agr. Exp. Station report for 1882, p. 14.

WATER SHED.	Years of record.	Mean annual rainfall, inches.	Mean annual discharge, inches.	Difference or evaporation, inches.
Lake Cochituate.....	29	49.11	22.08	27.03
Sudbury river.....	6	46.10	21.93	24.17
Mystic river.....	5	42.78	19.65	23.13
Croton river.....	13	46.64	26.35	20.29

Professor Geo. F. Swain* says: "It has been found by the experience of cities in regard to their water supply and by continued gauging of streams, that in very dry years in this climate, the total amount of rainfall discharged by streams falls as low as from twelve to fifteen inches over the entire drainage basin." He also states from data derived from the Smithsonian tables that the minimum rainfall is about seven-tenths of the mean. The average rainfall for the section under consideration is over forty inches, and the minimum rainfall is rarely below thirty-five inches. Calculations based upon these figures, and upon the assumed discharge of a large number of streams, indicate that throughout the Eastern and Middle States the evaporation for large areas, except in rocky and mountainous regions, is scarcely ever less than twenty inches, and in most localities considerably exceeds this.

What the effect of a diminished rainfall for a series of years would be is not evident; it is quite certain, however, that it would diminish the amount of water discharged by streams to a greater extent than it would diminish the evaporation. This is well illustrated by results obtained on streams from which the water supply of Boston is derived, for the years 1879 and 1880, which were exceptionally dry. In the following table is given the rainfall and amount of water discharged for these two years for the basins of Lake Cochituate, Sudbury and Mystic rivers:

* Report of Water-Power of Eastern New England, Tenth United States Census, Vol. XVI.

		Rainfall, inches.	Water collected, inches.	Evaporation, inches.
Lake Cochituate	Ave. 29 y'rs.	49.11	22.08	27.03
Lake Cochituate	1878.....	53.58	26.25	27.33
Lake Cochituate	1879.....	38.01	17.86	20.15
Lake Cochituate	1880.....	35.83	10.30	25.53
Sudbury river.....	Ave. 6 years	46.10	21.93	24.17
Sudbury river.....	1878.....	57.93	30.49	27.44
Sudbury river.....	1879.....	41.42	18.77	22.65
Sudbury river.....	1880.....	38.18	12.49	25.69
Mystic river.....	Ave. 5 years	42.78	19.65	23.13
Mystic river.....	1878.....	54.06	25.79	28.27
Mystic river.....	1879.....	35.30	17.61	17.69
Mystic river.....	1880.....	34.42	12.28	22.14

It will be seen that the year 1878 was marked by an exceptionally large precipitation, to the influence of which may be atttributed the apparently low evaporation of the following year. The rainfall for the year 1880 was less than any previously recorded on this basin, and although the previous year was dry, the apparent evaporation differs but little from the mean.

The Oswego basin, to which this locality must be assigned, receives an average of about thirty-five inches of rainfall per year. Calculations based upon the assumed discharge of the river show an average discharge of less than fourteen inches, leaving about twenty-one inches as the probable evaporation for the whole water-shed. But a portion of this basin, which includes the vicinity of this station, extending from Geneva to Penn Yan, receives on the average less than thirty inches of rainfall, and some years but little more than twenty inches. This is less than is reported from any other section of the United States east of the Mississippi valley. The average rainfall at the New York Agricultural Experiment Station for four years, 1883-1886 inclusive, was twenty-five inches. The average for other points in this basin, as shown bv the Smithsonian records, is as follows:*

	Number of years' observation.	Average rainfall, inches.
Penn Yan.....	39	28.31
Ithaca.....	19	34.54
Rochester.....	45	33.65
Syracuse.....	9	36.75
Oswego.....	18	40.42

* Tenth U. S. Census, Vol. XVI.

As the proportion of the rainfall evaporated is greatest during the summer, the monthly distribution of the rainfall has an important bearing upon the annual evaporation. Nearly all of the data which have been cited in regard to the rainfall and evaporation have been derived from stations along the Atlantic coast, and especially from the region which contributes to the water supply of Boston. For the purpose of comparing the distribution of the rainfall in those sections with that in this immediate vicinity, the following table, showing the ratio of the monthly rainfall to the mean monthly rainfall, is given. The figures for the Atlantic seaboard are the mean of 18 stations distributed along the coast from Maine to Washington. They are for a series of years, none of the stations having less than 20 years of record. These, with the figures for Boston and Penn Yan, were taken from the Tenth U. S. Census, Vol. XVI, for which they were compiled from the Smithsonian records:

	Atlantic seaboard.	Boston, 28 years.	Penn Yan, 39 years.	N. Y. Agr. Exp. Station, Geneva, N.Y., 5 years.
January	0.92	1.00	0.58	0.47
February	0.84	0.94	0.61	0.81
March	0.96	0.98	0.70	0.52
April	1.00	1.04	1.01	0.93
May	1.13	1.10	1.29	1.10
June	0.96	0.89	1.42	1.36
July	1.01	1.08	1.33	2.10
August	1.22	1.10	1.19	1.53
September	0.92	0.94	1.16	0.99
October	0.96	0.89	1.10	0.89
November	1.02	1.03	0.89	0.88
December	1.06	1.03	0.71	0.42

An inspection of this table shows a much greater proportion of rainfall during the summer months in this section than along the Atlantic coast. The per cent of the total annual rainfall received during five months from May 1 to Oct. 1 is, for the Atlantic seaboard 43.67, for Boston 42.57, for Penn Yan 53.25, and for N. Y. Agr. Exp. Station 59.0. In consequence of this large proportion of rainfall during the summer, the proportion of rainfall evaporated must be greater in this locality than in the sections which have been referred to. Taking this into consideration, it is probable that even with the small rainfall received here the evaporation is not much, if any, less than 20 inches.

All of the data given indicate that this section is one where drainage (percolation) is very small, and where the evaporation is nearly equal to the water which actually enters the soil, the water discharged by the streams being mostly derived from the flood waters of heavy showers in summer and from melting snows in spring, which have never entered the soil. It is impossible from any data now at hand to determine the flood water, but that it is considerable is shown by the volume of water discharged by streams during freshets. It probably amounts in this locality to four or five inches per annum.

In our lysimeters, where all of the water falling upon the surface is compelled to enter the soil, and where exceptionally good drainage is provided, the drainage water cannot be much in excess of the flood water, and in lysimeter No. 1 is no doubt less. Owing to the facility with which surplus water drains from the lysimeter soil, this soil is liable to become abnormally dry, and being cut off from the natural water-table, redistribution of moisture by capillarity does not occur to the same extent as in natural soils. This tends to reduce evaporation from the lysimeters below the average, but its effect is to some extent offset by the larger amount of water which the lysimeter soils absorb, so that the total evaporation from the lysimeters may approximate to that from soils outside. It is probably less in quantity, and when expressed in per cent of the water which enters the soil must be very much less. The drains which pass through the experimental plats deliver very little water during the summer months, and the soil is apparently dryer at the end of the season than in the spring, indicating what I believe to be true, not only for this, but for most localities devoted to agriculture, that during the warm months evaporation considerably exceeds the rainfall which enters the soil. I believe, moreover, that throughout the whole season the evaporation from agricultural lands nearly equals the rainfall which directly enters the soil. Most of the water which penetrates the soil to the level of the water-table is precipitated during the winter months, when the surface of the soil is frozen, and much of it enters the ground through crevices without leaching. In consequence of this the water which reaches the lower strata of the soil carries with it very little of the soluble elements of plant food contained in the surface soil. This assumption is confirmed by the small quantity of those elements found in well and spring waters in most localities. On the other hand, there is a gradual and almost constant movement of water by capillarity towards the surface to supply that lost by evaporation, which tends to concentrate the soluble matters near the surface, where they are most available for plants.

In lysimeters, owing to the increased water absorbed by the soil, the good drainage, and the consequently diminished evaporation ratio, the movement of the water is in general downwards, and carries with it the soluble matters of the soil, which finally are lost in the drainage. In this respect a lysimeter acts as a leach which must eventually remove all soluble plant food from the soil, provided that the rainfall is sufficient to cause a moderate drainage. That this is what has occurred in our lysimeters is clearly shown by the amount of soluble nitrogen compounds annually removed in the drainage water. No. 1 in sod, is exceptional in this respect, but with this lysimeter the drainage has been generally small, and has mostly occurred during and immediately after storms, indicating that it was really flood water which had run directly through holes in the soil. In Nos. 2 and 3 the leaching is decidedly marked, and the gradual increase in the amount of nitrogen lost, confirms the opinion that the loss of nitrogen is due to this action. The comparatively small loss for 1887 may be due either to the small drainage or to previous partial exhaustion of soluble matters from the soil. The enormous loss of nitrogen in the drainage waters of Nos. 2 and 3 is in itself presumptive evidence that the indications of the lysimeter are misleading when applied to natural soils. This loss is more each year per acre than would be replaced by a ton of dried blood or of nitrate of soda, and is more than would be removed from the soil by twenty average crops of timothy hay. It would be absurd to apply these figures to ordinary soils, as such a drain upon its resources would speedily make any land sterile.

Although lysimeter results are greatly influenced by climate and the amount and distribution of the rainfall, the agencies described above are sufficiently operative in all localities to render figures derived from ordinary lysimeters useless for generalization.

In a new lysimeter, described in the report of the horticulturist, an attempt is made to eliminate one source of the discrepancies mentioned, by maintaining an artificial water-table at a known level. This lysimeter will give the amount of evaporation and drainage under known conditions, and may aid in the discovery of some law respecting the movement of soil water.

Tables are appended giving the rainfall, drainage and chemical examinations for each of the lysimeters for 1887, and a summary of results since January, 1883:

AMOUNT AND ANALYSIS OF DRAINAGE FROM EACH LYSIMETER FOR 1887.

LYSIMETERS.	Rainfall, inches.	Drainage, inches.	PARTS PER MILLION.				
			Solids.	Chlorine.	Nitrogen, as ammonia.	Nitrogen, as nitrates.	Total nitrogen.
No. 1. SOD.							
January	.18	.14	145.6	15.7	.069	tr.	.069
February	2.97	1.885	145.6	7.1	tr.	0	tr.
March	.48	.54	142.8	3.5	.044	0	.044
April	1.37	.52	137.1	7.1	tr.	0	tr.
May	.46	.035	120.0	7.1	0	0	0
June	2.01	00	0	0	0	0	0
July	6.37	00	0	0	0	0	0
August	3.03	00	0	0	0	0	0
September	.75	00	0	0	0	0	0
October	1.74	00	0	0	0	0	0
November	1.58	00	0	0	0	0	0
December	....	.....	.....	.....	.....	.....	.....
No. 2. BARE SOIL.							
January	....	.045	859.6	21.42	.055	122.21	122.265
February	....	1.477	711.1	7.1	tr.	135.36	135.36
March	....	.185	779.7	10.7	....	95.2	95.2
April	....	.14	848.2	10.7	.092	126.9	126.992
May	....	.04	1000.	10.	.185	120.	120.185
June	....	0	0	0	0	0	0
July	....	.140	805.4	5.7	.14	69.17	69.31
August	....	.695	662.6	7.1	.091	84.36	84.451
September	....	0	0	0	0	0	0
October	....	0	0	0	0	0	0
November	....	.3	7.20	7	123	85.348	85.471
December	....	.....	.....	.....	....	.....	.....
No. 3. CULTIVATED SOIL							
January	....	.307	714.2	14.3	.078	113.2	113.278
February	....	1.400	457.1	4.3	.012	56.9	56.912
March	....	.790	391.4	tr.	.043	61.76	61.803
April	....	.530	445.7	7.1	tr.	64.33	64.33
May	....	.135	582.9	4.3	.10	74.32	74.42
June	....	0	0	0	0	0	0
July	....	.148	571.4	4.3	.089	51.46	51.549
August	....	1.055	662.8	4.3	tr.	55.16	55.16
September	....	0	0	0	0	0	0
October	....	0	0	0	0	0	0
November	....	4.	488	3	.1082	68.62	68.702
December	....	.....	.....	.....	....	.....	.....

Monthly rainfall and drainage in tons per acre from each lysimeter, with the loss of nitrogen calculated in pounds per acre, from January 1 to November 1, 1887.

	Rainfall, tons per acre.	Drainage, Tons Per Acre.			Loss of Nitrogen, Pounds Per Acre.		
		No. 1, sod.	No. 2, bare soil.	No. 3, cultivated soil.	No. 1.	No. 2.	No. 3.
January....	20.34	15.82	5.08	34.69	0	1.24	7.86
February ..	335.58	212.98	166.88	158.19	0	45.18	18.03
March	54.23	61.01	20.90	89.26	0	3.98	11.03
April	154.80	58.75	15.82	59.88	0	4.02	7.70
May	51.98	3.95	4.52	37.85	0	1.08	5.63
June	227.12	0	0	0	0	0	0
July.....	719.74	0	15.82	16.72	0	.02	1.72
August.....	342.36	0	78.52	119.20	0	13.27	13.16
September..	84.74	0	0	0	0	0	0
October....	196.60	0	0	0	0	0	0

MONTHLY average of rainfall at the Station, and drainage from each of the three lysimeters from August, 1, 1882, to November 1, 1887, inclusive.

	Rainfall, inches.	DRAINAGE.							
		No. 1, Sod.		No. 2, Bare Soil.		No. 3, Cultivated Soil.		Average of Three Lysimeters.	
		Inches.	Per cent.	Inches.	Per cent.	Inches.	Per cent.	Inches.	Per cent.
January	.939	.289	30.8	.374	39.8	.351	37.4	.338	36
February	1.596	1.021	64.0	.831	52.1	.610	38.2	.821	51.5
March	1.030	.669	65.0	.687	66.7	.636	61.7	.664	64.4
April	1.834	.655	35.7	.968	52.8	.964	52.6	.862	47
May	2.180	.248	11.4	.598	27.4	.929	42.6	.592	27.1
June	2.710	.244	9.0	.287	10.6	.738	27.2	.423	15.6
July	4.146	.001	.....	.742	17.9	.868	20.9	.537	12.9
August	3.032	.002	.....	.629	20.7	.878	29.0	.503	16.6
September	1.952	.027	1.4	.493	25.3	.762	39.0	.427	21.9
October	1.733	.016	.9	.537	31	.611	35.2	.388	22.4
November	1.722	.192	11.1	.360	20.9	.846	49.1	.466	27
December	.850	.098	11.5	.442	52	.372	43.8	.304	35.8
Total average per year	23.724	3.462	14.6	6.948	29.3	8.565	36.1	6.325	26.6

Yearly rainfall, drainage and loss of nitrogen from January 1, 1883, *to November* 1, 1887.

	Rainfall, inches.	Drainage, Inches.			Loss of Nitrogen, Lbs. per Acre.		
		No. 1. Sod.	No. 2. Bare soil.	No. 3. Cultivated soil.	No. 1.	No. 2.	No. 3.
1883	25.89	3.748	8.248	11.509	.....	.....	.....
1884	22.30	3.646	5.168	4.988	.2	69.5	132.2
1885	23.95	.357	7.088	10.989	1.02	218.7	218.2
1886	27.87	7.556	12.115	11.64	.08	357.7	234.1
1887*	19.36	3.435	2.722	4.365	0	68.79	65.13

SUNSHINE RECORD.

The daily record of sunshine, commenced May 4, 1885, was continued without break through 1886 and until September 8, 1887, when a change, not only in the location of the instrument, but also in the quality of paper used in it, rendered them untrustworthy, and observations were at that time suspended.

The total hours of sunshine for each month since the observations commenced and the daily record for the current year are presented. This record comprises only hours of bright sunshine, as our instrument fails to make a record in hazy or smoky weather, even when no clouds prevent.

* To November 1.

SUNSHINE, 1887.

	Before 9 A. M.	9-12.	12-3.	After 3 P. M.	Total.
	h. m.	h. m.	h. m.	h. m.	h. m.
Jan. 1	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....
3	-15	2-45	1-45	.....	4-44
4	1-15	2-15	.....	.....	3-30
5	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	.....
7	.....	-30	1-45	1-00	3-15
8	1-00	2-30	3-00	.....	6-30
9	.....	.....	.....	.....	.....
10	.....	1-15	1-45	-15	3-15
11	1-30	-45	.....	.....	2-15
12	.....	.....	.....	.....	.....
13	.....	-15	.....	.....	-15
14	.....	1-45	-15	.....	2-00
15	.....	.....	.....	.....	.....
16	.....	.....	-30	.....	-30
17	.....	.....	-30	.....	-30
18	.....	1-30	2-45	1-00	5-15
19	.....	.....	.....	.....	.....
20	.....	.....	.....	.....	.....
21	.....	.....	.....	.....	.....
22	.....	-45	.....	.....	-45
23	.....	.....	.....	.....	.....
24	.....	.....	.....	.....	.....
25	.....	.....	-45	-45	1-30
26	.....	.....	.....	.....	.....
27	1-30	1-30	1-45	-15	5-00
28	.....	.....	.....	.....	.....
29	.....	.....	.....	1-30	1-30
30	.....	.....	2-15	1-00	3-15
31	.....	.....	.....	.....	.....
Total	5-30	15-45	17-00	5-45	44-00
Per cent of possible sunshine	9-4	16-9	18-3	9-8	1-45
Feb. 1	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....
3	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	.....
5	.....	.....	.....	-15	-15
6	.....	.....	.....	.....	.....
7	.....	.....	.....	.....	.....
8	.....	.....	.....	-15	-15
9	-15	2-30	2-45	2-00	7-30
10	1-30	2-30	-30	.....	4-30
11	.....	.....	.....	.....	.....
12	.....	1-00	.....	.....	1-00
13	1-00	3-00	3-00	2-15	9-15
14	2-00	2-45	3-00	1-30	9-15
15	.....	.....	.....	.....	.....
16	.....	.....	.....	.....	.....
17	-45	-45	1-15	1-00	3-45
18	.....	.....	1-30	.....	1-30
19	.....	.....	.....	.....	.....
20	.....	.....	.....	.....	.....
21	.....	.....	.....	.....	.....
22	.....	.....	-30	.....	-30
23	1-15	2-00	.....	.....	3-15

SUNSHINE, 1887 — *(Continued)*.

	Before 9 A. M.	9-12	12-3.	After 3 P. M.	Total.
	h. m.	h. m.	h. m.	h. m.	h. m.
Feb. 24	-45	1-30	-45	.....	3-00
25	2-00	3-00	3-00	2-30	10-30
26	.....	.....	.....	.....	.....
27	.....	.....	.....	-15	-15
28	.....	2-30	3-00	1-15	6-45
Total	9-30	21-30	19-15	11-15	61-30
Per cent. of possible sunshine	11-2	25-6	22-9	13-3	18-2
March 1	.....	.....	-45	.....	-45
2	2-00	3-00	2-30	-30	8-00
3	2-15	1-00	1-00	.....	4-15
4	-15	2-45	3-00	2-30	8-30
5	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	.....
7	.....	.....	.....	.....	.....
8	2-30	3-00	3-00	2-45	11-15
9	2-30	2-15	1-30	.....	6-15
10	.....	.....	.....	-15	-15
11	1-30	2-30	3-00	2-00	9-00
12	2-15	3-00	3-00	2-00	10-15
13	2-15	-30	.....	.....	2-45
14	.....	.....	.....	.....	.....
15	.....	.....	.....	.....	.....
16	-30	.....	.....	.....	-30
17	.....	.....	.....	.....	.....
18	.....	.....	.....	.....	.....
19	.....	.....	.....	.....	.....
20	.....	-15	-15	.....	-30
21	.....	-30	.....	.....	-30
22	.....	.....	.....	.....	.....
23	1-00	3-00	3-00	1-45	8-45
24	-15	2-30	1-45	.....	4-30
25	.....	1-45	1-30	1-15	4-30
26	-45	2-00	2-30	-45	6-00
27	.....	.....	-15	.....	-15
28	.....	.....	-15	.....	-15
29	.....	1-45	-45	.....	2-30
30	2-15	3-00	3-00	1-45	10-00
31	2-45	3-00	3-00	2-30	11-15
Total	23-00	35-45	34-00	18-00	110-45
Per cent of possible sunshine	24-6	38-4	36-6	19-2	29-7
April 1	1-30	3-00	3-00	1-30	9.00
2	2-30	3-00	3-00	2-15	10-45
3	2-00	3-00	2-00	1-15	8-15
4	.....	.....	.....	.....	.....
5	-45	-45	-10	-05	1-45
6	2-15	3-00	3-00	2-45	11-00
7	2-15	3-00	3-00	3-00	11-15
8	2-15	3-00	3-00	2-15	10-30
9	1-30	3-00	3-00	1-45	9-15
10	1-15	3-00	3-00	2-15	9-30
11	.....	.....	-30	-15	-45
12	.....	.....	.....	.....	.....

SUNSHINE, 1887 — (*Continued*).

	Before 9 A. M.	9-12.	12-3.	After 3 P. M.	Total.
	h. m.	h. m.	h. m.	h. m.	h. m.
April 13	.....	.....	2-00	-45	2-45
14	.....	.....	1-00	-30	1-30
15	.....	.....	-30	1-15	1-45
16	.....	.....	.....	.....	.....
17	1-00	3-00	2-00	-15	6-15
18	.....	.....	.....	.....	.....
19	2-00	3-00	3-00	2-00	10-00
20	2-45	3-00	1-30	.....	7-15
21	1-30	1-30	.....	1-15	4-15
22	1-00	2-30	3-00	2-45	9-15
23	.....	.....	.....	.....	.....
24	2-45	2-30	-30	.....	5-45
25	2-45	2-30	.....	.....	5-15
26	3-00	2-00	.....	.....	5-00
27	2-15	2-30	-15	.....	5-00
28	2-45	1-00	.....	.....	3-45
29	.....	.....	.....	.....	.....
30	.....	2-30	3-00	3-45	9-15
Total	38-00	50-45	40-30	29-45	159-00
Per cent of possible sunshine	34-5	56-2	45-00	27-00	39-9
May 1	2-45	1-30	-30	-30	5-15
2	-15	2-00	1-30	-15	4-00
3	1-00	2-00	3-00	3-30	9-35
4	1-30	3-00	3-00	3-15	10-40
5	2-00	1-30	2-15	2-15	8-00
6	1-45	2-00	1-00	-15	5-00
7	-30	1-15	3-00	-15	5-00
8	3-15	3-00	1-00	1-30	8-45
9	2-45	3-00	1-45	-30	8-00
10	-15	-15	.....	3-45	4-15
11	3-30	3-00	3-00	3-30	13-00
12	2-15	3-00	1-00	2-15	8-30
13	3-30	3-00	3-00	3-30	13-00
14	3-30	3-00	3-00	3-30	13-00
15	3-30	3-00	3-00	3-30	13-00
16	3-30	3-00	3-00	2-45	12-15
17	2-45	1-45	3-00	3-00	8-00
18	1-30	3-00	2-00	2-30	9-00
19	3-15	3-00	3-00	1-30	10-45
20	3-00	3-00	3-00	3-00	12-00
21	3-15	3-00	3-00	3-30	12-45
22	3-00	3-00	3-00	.....	9-00
23	1-30	2-30	1-30	-30	6-00
24	-30	2-30	1-45	.....	4-45
25	2-30	3-00	2-00	-45	8-15
26	2-45	1-00	-30	.....	4-15
27	.....	.....	.....	1-00	1-00
28	.....	.....	.....	.....	.....
29	2-45	3-00	3-00	3-45	12-30
30	4-00	3-00	3-00	3-15	13-15
31	3-30	3-00	3-00	2-45	12-15
Total	70-00	72-15	64-45	58-00	265-00
Per cent of possible sunshine	52-5	77-7	69-6	43-4	58-4

SUNSHINE, 1887 — (*Continued*).

	Before 9 A. M.	9–12.	12–3.	After 3 P. M.	Total.
	h. m.	h. m.	h. m.	h. m.	h. m.
June 1	.....	.....	.....	4–00	4–00
2	-30	-15	.....	.....	-45
3	1-45	3-00	3-00	4–00	11–45
4	.....	.....	.....	.....	.....
5	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	.....
7	-45	-30	.....	-15	1–30
8	.....	1-00	2–15	3–45	7–00
9	.....	.....	-45	2–00	2–45
10	2-30	3-00	2–45	4–00	12–15
11	3-45	3-00	3–00	3–45	12–30
12	4-00	3-00	3–00	2–45	12–45
13	3-45	2-45	1–00	2–30	10–00
14	4-00	3-00	3–00	4–00	14–00
15	4-00	3-00	3–00	3–45	13–45
16	3-00	1-30	1–30	3–15	9–15
17	-30	1-15	-15	.....	2–00
18	.....	.....	.....	.....	.....
19	.....	.....	1–30	.....	1–30
20	.....	3-00	3–15	3–15	9–15
21	1-00	1-15	-30	1–15	4–00
22	.....	-15	-30	-45	1–30
23	4-00	2-30	2–00	2–00	10–30
24	.....	1-15	-15	-30	2–00
25	4-00	2-30	2–00	1–00	9–30
26	3-45	3-00	3–00	3–45	13–30
27	3-30	3-00	2–30	2–30	11–30
28	3-45	3-00	3–00	4–00	13–45
29	3-45	3-00	3–00	3–45	13–30
30	3-45	3-00	3–00	2–15	12–00
Total	56-00	51-00	47–45	63–00	217–45
Per cent of possible sunshine	40-4	56-6	53–0	45–5	47–6
July 1	2-45	2-30	2–45	3–00	11–00
2	3-30	3-00	3–00	3–00	12–30
3	3-30	3-00	1–30	2–15	10–15
4	2-45	3-00	2–15	3–15	11–15
5	2-00	1-15	-15	1–15	4–45
6	2-00	2-15	-45	3–00	8–00
7	3-45	3-00	3–00	3–00	12–45
8	3-30	3-00	3–00	3–30	13–00
9	1-30	2-45	.....	.....	4–15
10	1-15	1-00	.....	.....	2–15
11	3-30	3-00	3–00	3–30	13–00
12	3-30	3-00	3–00	3–30	13–00
13	1-30	3-00	3–00	3–45	11–15
14	3-30	3-00	3–00	2–00	11–30
15	-30	.....	.....	1–00	1–30
16	2-45	3-00	2–30	2–00	10–15
17	.....	.....	2–00	2–00	4–00
18	.....	.....	.....	1–15	1–15
19	2-00	3-00	2–30	3–30	11–00
20	3-00	3-00	3–00	2–00	11–00
21	.....	1-45	1–30	.....	3–15
22	2-00	1-00	1–30	.....	4–30
23	-15	2-45	3–00	3–00	9–00
24	2-30	2-00	3–00	3 -00	10–30

SUNSHINE, 1887 — *(Continued).*

	Before 9 A. M.	9–12.	12–3.	After 3 P. M.	Total.
	h. m.	h. m.	h. m.	h. m.	h. m.
July 25	-30	.....	.....	.....	-30
26	.....	1-30	3-00	3-30	8-00
27	3-15	3-00	3-00	3-15	12-30
28	3-00	3-00	3-00	2-15	11-15
29	.....	1-15	2-45	3-00	7-00
30	2-30	3-00	3-00	3-00	11-30
31	2-30	3-00	3-00	3-15	11-45
Total	63-15	68-00	65-51	71-00	267-30
Per cent of possible sunshine	4-59	73-1	70.1	51-4	57-9
Aug. 1	3-00	2-45	2-30	2-30	10-45
2	2-30	2-45	3-00	3-00	11-15
3	2-30	3-00	3-00	3-00	11-35
4	.....	2-15	1-00	3-00	6-10
5	.....	.....	-45	2-00	2-45
6	.....	2-30	3-00	3-00	8-30
7	3-00	3-00	3-00	3-45	12-45
8	3-15	3-00	3-00	3-15	12-30
9	3-00	3-00	3-00	3-00	12-00
10	.....	.....	.....	.....	.....
11	.....	.....	.....	1-15	1-15
12	2-00	3-00	3-00	3-00	11-00
13	2-15	3-00	3-00	3-30	11-45
14	3-00	2-45	2-45	1-00	9-30
15	-15	3-00	-30	-30	4-15
16	1-45	1-30	.....	3-00	6-15
17	2-00	2-00	-30	.....	4-30
18	-45	1-30	2-30	1-30	6-15
19	-45	1-30	2-30	1-30	6-15
20	2-00	3-00	3-00	2-45	10-45
21	.....	3-00	.....	.....	3-00
22	.....	.....	.....	.....	.....
23	-15	.....	1-15	3-00	4-30
24	-15	-30	-15	.....	1-00
25	2-45	1-45	3-45	3-15	10-30
26	3-00	2-45	-30	3-00	9-15
27	2-45	2-00	-15	1-15	6-15
28	2-45	1-15	2-00	3-00	9-00
29	2-45	3-00	3-00	2-00	10-45
30	2-30	3-00	1-15	3-00	9-45
31	2-45	3-00	3-00	3-00	11-45
Total	51-45	63-45	54-15	66-00	235-45
Per cent of possible sunshine	42-6	68-5	58-3	54-3	55-0
Sept. 1	3-00	2-30	.....	.....	5-30
2	.....	.....	.....	.....	.....
3	1-45	2-30	3-00	3-00	10-15
4	3-00	3-00	3-00	3-00	12-00
5	3-00	3-00	-45	2-00	8-45
6	.....	.....	.....	.....	.....
7	1-00	1-00	1-30	.....	3-30
8	-30	2-00	-15	-45	3-30
Total	12-15	14-00	8-30	8-45	43-30
Per cent of possible sunshine	45-0	58-3	36-2	31-5	42-0

Monthly Summary of Sunshine from May 1, 1885, *to September* 1, 1887.

	1885.		1886.		1887.	
	Hours.	Per cent.	Hours.	Per cent.	Hours.	Per cent.
January	.....	....	43.25	14.3	44.00	14.5
February	.....	....	80.00	26.7	61.50	18.2
March	.....	....	83.25	22.3	110.75	29.7
April	.....	....	144.75	36.3	159.00	39.9
May	165.00	36.4	235.75	51.9	265.00	58.4
June	237.5	52.0	252.25	54.2	217.75	47.6
July	284.75	53.8	243.25	52.6	267.5	57.9
August	353.5	38.1	240.25	56.0	235.75	55.0
September	206.75	55.3	200.3	53.7	.....	.....
October	134.5	39.3	142.75	41.8	.....	.....
November	53.00	18.1	102.00	34.8	.....	.....
December	50.00	17.6	68.5	24.2	.....	.....

REPORT OF THE ASSISTANT CHEMIST.*

The principal topics considered in this report are summarized below in the order in which they are presented:

1. Variation in the composition of grasses for two successive years.
2. Early and late cut timothy.
3. Hay from different localities.
4. Forage plants.
5. Analyses of fodders.
6. Wheat and its products.
7. Amount of water in farm products.
8. New vs. old hay and grain.
9. Influence of fertilizers upon the composition of timothy and clover.
10. Amount of nitrogen, phosphoric acid and potash removed from the soil by different crops.
11. Average composition of feeding stuffs examined at this station.
12. Methods of analysis.
13. Some edible fungi.
14. Ice cream poisoning.

Since there seems to be some confusion and misunderstanding of the terms used in the expression of fodder analyses, a few words of explanation may be appropriate at this point before entering upon a consideration of the fodders themselves.

Water.—The loss in weight of a fodder by drying, usually at 100 to 110 C., is due to the moisture or water which the fodder contains.

Ash.—That part of the fodder which remains unconsumed by burning, constitutes the ash or mineral matter. The ash ingredients form the solid matter of the animal frame-work — bones — and occur also in small quantities in the muscles, blood, etc.

Albuminoids.—The albuminoids are the principal nitrogenous portion of fodders — the muscle-formers — sometimes also called protein. The albuminoids are not a definite compound, but are made up of a large number of nitrogenous products which have usually been classed alike for feeding purposes. The white of an egg, the tenacious mass —

*E. F. Ladd.

gluten — which remains on washing the dough from wheat flour and animal muscle are common examples of this class of products.

Not all of the nitrogenous matter of feeding stuffs is in the form of albuminoids, but often a considerable portion is in what may be termed a transitory state known by the general name amides. Amides are supposed to have a less nutritive value than the true albuminoids. However, they probably have a greater nutritive value than many experimenters have assigned to them.

Crude fiber is the woody portion of vegetable matter which is unacted upon by dilute acids or alkalies. Crude fiber has little or no direct nutritive value to the animal.

Nitrogen-free extract, sometimes called carbohydrates, is a mixture of various substances. The starches, sugars, dextrine, pectic and mucilaginous bodies, gums, etc., are the principal constituents.

Fat.—The ether extract of feeding stuffs, taken as fat or vegetable oils, is a mixture of oils, wax, coloring matter, etc. Cotton seed oil, linseed oil, corn oil, etc., are common examples.

VARIATION IN THE COMPOSITION OF GRASSES FOR TWO YEARS.

In my report for 1886* I noted the variation in the chemical composition of grasses for different cuttings of the same season, showing that the proportion of albuminoids to the other organic constituents of the plant was much larger in the second and subsequent cuttings than in the first. Another year gives us an opportunity to determine what variation there may be in the chemical composition of grasses for different years when grown under like conditions, so far as soil and locality are concerned. With the exception of the timothy, the grasses were all from the Station grass plats for both years and were collected at about the same stage of growth, that is, full bloom. The timothy was taken both years from the same place, in a large field. It may be well to state here that early in the spring of 1886 all of the grass plats received a top-dressing of acid phosphate, but none was applied to the field of timothy. The following table gives the chemical composition of the grasses for both years:

*New York Agricultural Experiment Station, 1886, p. 374.

GRASSES.	FRESH SUBSTANCE.						DRY SUBSTANCE.				
	Water.	Ash.	Albuminoids. Nx6.25.	Crude fiber.	Nitrogen free extract.	Fat (ether extract).	Ash.	Albuminoids. Nx6.26.	Crude fiber.	Nitrogen free extract.	Fat (ether extract).
Orchard grass, '86	65.00	1.99	2.58	12.54	16.73	1.16	5.70	7.38	35.84	47.77	3.31
Orchard grass, '87	73.19	1.84	2.40	10.56	10.87	1.14	6.86	8.94	39.39	40.56	4.25
Fort Bellingham, '86	61.78	2.41	2.98	13.75	17.79	1.29	6.30	7.81	35.99	46.53	3.37
Fort Bellingham, '87	63.38	2.30	3.68	12.23	17.12	1.29	6.27	10.06	33.39	46.75	3.53
Meadow Fescue, '86	68.70	1.97	2.44	10.93	14.82	1.14	6.29	7.81	34.93	47.34	3.63
Meadow Fescue, '87	66.52	2.96	3.73	11.14	14.34	1.31	8.84	11.13	33.28	42.83	3.92
Reed Canary, '86	65.23	2.47	3.65	10.33	16.98	1.34	7.10	10.50	29.72	48.83	3.85
Reed Canary, '87	66.52	1.81	3.60	10.65	16.17	1.25	5.42	10.75	31.81	48.29	3.73
Tall Meadow Oat, '86	69.07	1.63	2.09	10.76	15.46	1.01	5.26	6.75	34.78	49.94	3.27
Tall Meadow Oat, '87	69.86	1.83	3.12	10.50	13.30	1.39	6.06	10.37	34.83	44.12	4.62
Timothy, '86	71.36	1.36	1.34	8.56	16.54	.84	4.75	4.69	29.88	57.75	2.93
Timothy, '87	59.85	2.22	3.26	12.30	21.14	1.23	5.54	8.12	30.65	52.62	3.07

The great variation shown in the dry substance, also in the water content, for the two years, leads us to carry further our investigation, to learn whether any other differences could be found.

ALBUMINOID AND NON-ALBUMINOID NITROGEN.

NAME OF GRASS.	Date cut.	Total nitrogen.	Albuminoid nitrogen.	Amide nitrogen.	Per cent of total nitrogen in amide form.
Orchard grass, '86	June 9...	1.18	.44	.74	62.71
Orchard grass, '87	June 7...	1.43	1.13	.30	20.98
Fort Bellingham, '86	June 15...	1.25	.87	.38	30.40
Fort Bellingham, '87	June 14...	1.61	1.17	.44	27.33
Meadow Fescue, '86	June 11...	1.25	1.08	.17	13.60
Meadow Fescue, '87	June 14...	1.78	1.28	.50	28.09
Reed Canary, '86	June 19...	1.68	1.30	.38	22.61
Reed Canary, '87	June 14...	1.72	1.44	.28	12.28
Tall Meadow Oat, '86	June 9...	1.08	.92	.16	14.81
Tall Meadow Oat, '87	June 7...	1.66	1.30	.36	21.67
Timothy, '86	June 28...	.75	.38	.37	49.33
Timothy, '87	June 29...	1.30	.92	.38	29.23

Unfortunately, the sugars and starch were not determined in the grasses for 1886 ; so we are unable to compare the differences in the nitrogen free extract for the two years.

DIGESTIBILITY.

The following table gives the amount of total or crude albuminoids, the true albuminoids and the per cent of each, digested by pepsin digestion:

GRASS.	Per cent of crude albuminoids.	Per cent of true albuminoids.	Per cent undigested.	Per cent of crude albuminoids digested	Per cent of true albuminoids digested.
Orchard grass, 1886	7.38	2.75	2.44	66.93	11.28
Orchard grass, 1887	8.94	8.12	3.69	58.72	54.55
Fort Bellingham, 1886	7.81	5.44	1.81	76.82	66.72
Fort Bellingham, 1887	10.06	7.31	3.12	67.99	57.31
Meadow Fescue, 1886	7.81	6.75	2.73	65.04	59.55
Meadow Fescue, 1887	11.13	8.00	3.37	69.72	57.87
Reed Canary, 1886	10.50	8.13	2.75	73.81	66.17
Reed Canary, 1887	10.75	9.00	3.81	64.56	57.66
Tall Meadow Oat, 1886	6.75	5.75	1.88	72.15	67.30
Tall Meadow Oat, 1887	10.37	8.12	2.94	71.63	63.79
Timothy, 1886	4.69	2.38	2.06	56.08	13.44
Timothy, 1887	8.12	5.75	3.25	59.97	43.47

ASH ANALYSES.

Partial ash analyses were made for a few of the grasses, for both years, and the results are given in the following table:

	Ash.	P_2O_5	K_2O	Na_2O	CaO	MgO
Orchard grass, '86	5.69	7.96	32.26	.84	8.66	1.62
Orchard grass, '87	6.95	7.40	42.72	.47	7.20	2.11
Meadow Fescue, '86	6.17	6.90	23.66	1.26	.....	.....
Meadow Fescue, '87	6.06	7.03	31.56	5.28	11.84	3.35
Tall Meadow Oat, '86	5.03	6.67	39.92	4.37	7.40	tr.
Tall Meadow Oat, '87	5.94	7.16	34.60	7.04	7.76	3.07
Timothy, '86	4.06	4.41	27.02	1.62	.....	.....
Timothy, '87	5.54	6.95	30.72	5.28	10.00	2.24

In order to compare these analyses to learn the real differences, it is necessary to calculate the ash analysis on the dry substance, and the following table gives the data:

ASH CONSTITUENTS IN THE HAY.

	P_2O_5	K_2O	Na_2O	CaO	MgO	Nitrogen.
Orchard grass, '86	.454	1.835	.048	.493	.092	1.18
Orchard grass, '87	.514	2.699	.032	.500	.147	1.43
Meadow Fescue, '86	.426	1.460	.078	.....	.....	1.25
Meadow Fescue, '87	.426	1.912	.320	.717	.203	1.78
Tall Meadow Oat, '86	.335	2.008	.230	.372	tr.	1.08
Tall Meadow Oat, '87	.428	2.055	.418	.461	.182	1.66
Timothy, '86	.179	1.097	.066	.....	.....	.75
Timothy, '87	.385	1.702	.292	.554	.123	1.30

An inspection of the table of analyses for the dry substance shows the hays for this season to be considerably richer in albuminoids than were the hays from the same plats last year, while the nitrogen free extract is proportionally lower. The next point of importance is to know how the yield per acre compares for the two years. Unfortunately, no account was taken of this, but my colleague, Mr. Plumb, has furnished me with some figures for the yield of hay upon the Station plats which will serve as an indication of how the yield compares for the two years. The grass on 100 square feet of the same plats from which my samples were taken was cut and the hay weighed for each year, and was as follows:

	Pounds.
Orchard grass, 1886	22
Orchard grass, 1887	12¾
Tall Meadow Oat, 1886	15
Tall Meadow Oat, 1887	12
Meadow Fescue, 1886	12¼
Meadow Fescue, 1887	7

We do not know whether the proportion of water in the hay for the two years was the same or not, but taken as the figures stand we find that the yield of hay from the same plats was about 39 per cent less for 1887 than for 1886, and the table of analyses shows that in these same hays there was an increase in albuminoids of about 38 per cent. It seems, then, that the increase in nutritive value for the hays this year over last year has been at the expense of a smaller crop, and if, as seems true from the data we have, the real difference between the feeding value of a maximum and a minimum crop may not always be so great as would be indicated by the yield of hay per acre. We have found, in these experiments at least, that the minimum crop of 1887 had a considerably higher nutritive value from its greater richness in albuminoids than did the larger crop of 1886.

An examination of the table of the digestibilities shows that the digestion coëfficients are lower with the hays of this year than for those of last, which at first seems to be contradictory to the general opinion that the more highly nitrogenous the hay is the higher the digestion coëfficient, but still, in general this rule may be true, for other influences not generally recognized in this connection seem to enter in to modify the results. When we compare the grasses of this season we find those containing the largest proportion of albuminoids to be the most digestible, and an inspection of the table in my report for last year shows the same relation to hold for the grasses of that season, although when we compare the grasses of this year with that grown upon the same plats last year, which were poorer in albuminoids, we find them showing the opposite. This variation between different years may be due largely to meteorological and other influences which can only be determined after a number of years' careful observations. Believing that a comparison of the meteorological records for a series of years in connection with the analysis of the plants, will aid in answering some of these questions, I have tabulated from the Station meteorological records, in periods of ten days, from April 1 to the end of June, the sunshine, air temperature, soil temperature at three and nine inches depths and the rainfall. I have preferred to use the noon tem-

perature for both soil and air, but further study may show it to be necessary to change this to more complete records. The following table gives the total or averages for periods of ten days:

	April 1-10.	April 11-20.	April 21-30.	May 1-10.	May 11-20.	May 21-31.	June 1-10.	June 11-20.	June 21-30.	Averages or totals
Hours of bright sunshine, 1886.	37	65	43	66	77	92	101	85	67	633
Hours of bright sunshine, 1887	81	30	48	69	113	84	40	86	91	642
Noon temp., 1886	39.6	60.1	61.2	60.7	62.5	67.1	71.5	72.6	71.3	63.1
Noon temp., 1887	48.0	41.6	52.5	70.4	70.4	71.6	68.1	77.9	75.1	63.9
Noon soil temp., 3 in., 1886.....	42.1	57.0	61.0	61.8	61.3	65.8	71.6	74.8	71.1	62.3
Noon soil temp., 3 in., 1887.....	....	45.6	50.9	65.5	69.1	71.5	69.8	76.9	76.6	65.7
Noon soil temp., 9 in., 1886.....	38.2	49.2	54.4	56.4	55.6	56.9	62.9	68.7	65.2	56.3
Noon soil temp., 9 in., 1887.....	....	42.1	44.6	55.8	59.7	62.6	63.4	66.7	65.6	57.5
Rainfall, inches, 1886	3.05	.27	.81	.66	.91	.35	.44	.39	2.09	8.97
Rainfall, inches, 1887	0	.34	1.03	.04	0	.42	.76	.64	.61	3.84

We find that the temperature of both the air and soil was considerably lower during April of the present year than for April of 1886, while for the season just passed the rainfall for May was almost nothing until the very last days of the month. These two influences may have largely determined the growth, that is, the formation and number of stalks, while the higher temperature and more sunshine during the period of most rapid growth may have, by increasing the evaporation through the plant, produced the large albuminoid content of the grasses. When another year's records shall have been added to those already given it is hoped that we may be able to trace more fully the relation between plant growth and the variation in temperature, sunlight and rainfall.

EARLY AND LATE CUT TIMOTHY.*

1. *Analysis of the Hays.*
2. *Sugars and Starch.*
3. *Albuminoid and Non-Albuminoid Nitrogen.*

* The data and conclusions given under this topic are essentially those given in the article "Some Changes in Timothy as it Approaches Maturity," published in Agricultural Science, Vol. 1, No. 10.

4. *Digestibility.*
5. *Ash Analysis.*
6. *Conclusions.*

Several experiments have already been made, and published by others, to determine the relative value of early and late cut hay for feeding, but most of these experiments have been conducted without a chemical examination of the hays and without determining their digestibility, but rather as to the quantity of hay harvested at different periods, or to their value as found by feeding experiments of short duration.

The present investigation was undertaken, wholly from a chemical standpoint, to find whether any differences could be detected in the chemical composition and digestibility of three samples of timothy cut June 29, while in full bloom, and three other samples from the same plats, July 14, after the seeds had formed, but before they were matured.

ANALYSIS.

Plat.	TIMOTHY.	FRESH SUBSTANCE.						DRY SUBSTANCE,				
		Water.	Ash.	Albuminoids, Nx 6.25	Crude fiber.	Nitrogen free extract.	Fat (ether extract).	Ash.	Albuminoids, Nx 6.25.	Crude fiber.	Nitrogen free extract.	Fat (ether extract).
VI	Full bloom	57.32	1.85	3.41	13.92	22.39	1.11	4.33	8.00	32.61	52.46	2.60
VI	Late cut	46.98	1.91	3.38	18.56	27.74	1.43	3.61	6.37	35.01	52.32	2.69
XV	Full bloom	59.85	2.22	3.26	12.30	21.14	1.23	5.54	8.12	30.65	52.62	3.07
XV	Late cut	48.68	2.31	3.31	19.35	25.03	1.32	4.51	6.44	37.71	48.77	2.57
XIX	Full bloom	59.77	2.23	3.14	12.74	20.84	1.28	5.54	7.81	31.67	51.80	3.18
XIX	Late cut	48.78	2.48	3.14	16.57	27.43	1.60	4.84	6.13	32.37	53.53	3.13

An examination of the above table shows a marked diminution in the per cent of ash and albuminoids of the dry substance for the late cut hay and a considerable increase in fiber, while the proportion of nitrogen free extract remains practically unchanged.

In the fresh substance there has been a large loss of water, but this diminution in water tended to equalize the albuminoids so that the per cent present is very nearly the same for the fresh substance in both the early and late cut timothy.

SUGARS AND STARCH.

The slight differences in the amount of nitrogen free extract of the dry substance and for the early and late cut hay leads us to further examine them and to determine the amount of sugar and starch to see whether there exists any real difference in the composition of the nitrogen free extract.

Plat.	TIMOTHY.	Invert sugar, etc.	Sucrose, etc.	Starch.	Per cent of nitrogen free extract as sugars and starch.
VI. ..	Full bloom	3.60	6.36	22.61	62.08
VI. ..	Late cut	2.60	4.00	22.38	55.39
XV. ..	Full bloom	3.72	5.96	18.07	52.73
XV. ..	Late cut	2.32	5.40	21.66	60.24
XIX. ..	Full bloom	3.04	4.68	19.45	52.46
XIX. ..	Late cut	2.00	5.20	22.61	55.69

In the hays from plat VI, we find the more mature hay suffered a loss in per cent of both sugars and starch, while in plats XV and XIX there was a gain of starch. Of invert sugar there was a diminution in per cent in each case for the more mature hay.

ALBUMINOID AND NON-ALBUMINOID NITROGEN.

A determination of the true albuminoid nitrogen and amide nitrogen in the early and late cut timothy gave us the following results:

Plat.	TIMOTHY.	Total nitrogen.	Albuminoid nitrogen.	Amide nitrogen.	Per cent of total nitrogen in amide form.
VI. ..	Full bloom	1.28	1.20	.08	6.40
VI. ..	Late cut	1.02	.84	.18	17.64
XV. ..	Full bloom	1.30	.92	.38	29.23
XV. ..	Late cut	1.03	.68	.35	33.98
XIX. ..	Full bloom	1.25	1.20	.05	4.00
XIX. ..	Late cut	.98	.98	.00	.00

From an examination of the preceding table we find that the total nitrogen averages 20.56 per cent less in the late cut timothy than in that cut in full bloom. Instead of the proportion of albuminoid nitrogen to the total nitrogen increasing between the period of full bloom and seed formation, there was rather a considerable diminution, with a corresponding increase in the relative proportion of amide nitrogen. The increase in amide nitrogen was probably due to the breaking up and transferring of the albuminoids of the stalk to the seeds, which were formed but not fully developed when the second cutting was made. That is, the nitrogen taken up by the grass at this period of its growth seems to have been very small, while the transfer of material from the stem to the seed was rapidly going forward, and the formation of starch and fiber was progressing throughout the plant, so that the increase of organic matter was considerable.

DIGESTIBILITY.

Having determined the principal proximate constituents of the hays, we may, by determining the digestibility of their albuminoids, be able to throw further light upon the relative value of early and late cut hay for feeding;

Plat.	TIMOTHY.	Total albuminoids, Nx. 6.25.	True albuminoids.	Per cent undigested.	Per cent of total albuminoids digested.	Per cent of true albuminoids digested.
VI ...	Full bloom.....	8.00	7.50	3.87	51.62	48.40
VI ...	Late cut.....	6.37	5.25	3.56	44.11	32.19
XV ...	Full bloom.....	8.12	5.75	3.25	59.97	43.47
XV ...	Late cut.....	6.44	4.25	.....	.....	.....
XIX ...	Full bloom.....	7.81	7.50	3.75	50.70	50.00
XIX ...	Late cut.....	6.13	6.13	3.87	36.83	36.83

From the above table we find that there was a marked decrease in digestibility of the albuminoids for the late cut timothy over that cut in full bloom, and the figures are further suggestive as pointing out a possible explanation for the great variation in the digestion coëfficients found by different investigators, or the same investigators in different years, for similar hays. If, as seems to be the case from the trials we have made, the more mature hay is less digestible than that cut earlier, then two feeding trials made with similar hays, but at different stages of maturity, might show a difference in their coëfficients of digestibility of at least 23 per cent as indicated by the last table, which, aside from any idiosyncrasies of the animal, might be sufficient to reconcile the results.

ASH ANALYSIS.

A partial analysis of the ash of the grasses was made, with results as shown in the following table:

Plat.	TIMOTHY.	Ash.	Phosphoric acid. P_2O_5	Potash. K_2O	Soda. Na_2O	Lime. CaO	Magnesia. MgO
VI. ..	Full bloom....	4.41	4.96	32.88	4.48	8.64	2.53
VI. ..	Late cut.....	3.60	4.50	28.87	6.68	13.20	2.01
XV. ..	Full bloom....	5.54	6.95	30.72	5.28	10.00	2.24
XV. ..	Late cut.....	4.51	7.24	26.68	11.20	11.20	1.65
XIX. ..	Full bloom....	5.54	6.14	29.96	.....	7.76	2.04
XIX. ..	Late cut.....	4.84	6.03	29.44	6.82	7.68	2.16

In the late cut hay the per cent of ash was considerably diminished and the composition of the ash had changed. There was a marked increase in soda and of lime in VI and XV, and a corresponding falling back in per cent of potash and magnesia except in the last, while in phosphoric acid there was a gain in per cent in one instance and a loss in the other two. The figures may be more suggestive by calculating the per cent of ash constituents in the hay itself, dry substance, as given in the following table:

Plat.	TIMOTHY.	Phosphoric acid. P_2O_5	Potash. K_2O	Soda. Na_2O	Lime. CaO	Magnesia. MgO	Nitrogen
VI. ..	Full bloom....	.219	1.450	.197	.381	.111	1.28
VI. ..	Late cut.....	.172	1.039	.240	.475	.072	1.02
XV. ..	Full bloom....	.385	1.702	.293	.554	.124	1.30
XV. ..	Late cut.....	.326	1.203	.505	.505	.074	1.03
XIX. ..	Full bloom....	.340	1.659	.....	.430	.119	1.25
XIX. ..	Late cut.....	.292	1.425	.330	.372	.104	.98

Calculated in the hay, dry substance, we find the relation between our figures do not hold, in all cases, the same as in the ash. In the hay we find a diminution in the proportion of phosphoric acid, potash, magnesia and nitrogen taken up by the timothy, as it approached maturity, and a considerable increase in soda, while with the lime we find both gain and loss.

CONCLUSIONS.

Having now examined the early and late cut timothy so fully as our time will admit for the present, we may briefly summarize from the tables already given such conclusions as seem permissible from our data.

1. The amount of water in the timothy diminished rapidly after the period of full bloom.

2. There was a large increase in the amount of crude fiber in late cut timothy, over that cut at period of full bloom.

3. As the grass approached maturity there was a considerable diminution in the per cent of sugars, and an increase in starch.

4. The proportion of albuminoids to the other organic constituents diminished after the period of full bloom.

5. The albuminoids of timothy were much less digestible in the late cut hay than in that at full bloom.

6. Between the period of full bloom and seed formation there seems to have been a reduction of some of the albuminoids to the amide form, probably in the course of the albuminoids being transferred from the stem to the seed, or in some way connected with the formation or translocation of the sugars and starch.

7. From our experiments it seems that the increase in the quantity of timothy, after the period of full bloom, was not sufficient to overbalance the lower digestibility of the albuminoids, together with the large increase in fiber.

8. Finally, from a chemical point of view, it seems preferable to cut timothy, for feeding, at the period of full bloom, rather than after the seeds have formed.

HAYS FROM DIFFERENT LOCALITIES.

For the purpose of determining the average chemical composition of hay, or of any agricultural product, it is necessary that samples be secured from different localities, in order that we may determine the climatic and other influences which affect the composition and productiveness of the crop. Such samples should be had for a number of years, that we may know what yearly changes are to be expected for each locality. It is shown from the analyses under the head of "Variation in the chemical composition of grasses for two years," that we may expect as great difference between the same kind of grass grown on the same plat for two successive years as between that from widely separated localities, so that the hay from any locality must be examined for a series of years before we can determine the average composition for that locality, and from these averages must be gathered the average for the product.

As a beginning to the study upon the composition of the grasses, a few samples of timothy have been secured, during the past year from Wisconsin and from Maine, for which I am indebted to Dr. H. P. Armsby, of the Agricultural Experiment Station at the University of

Wisconsin, and to Prof. W. H. Jordan, of the Maine Agricultural Experiment Station. These samples, with those from this Station, show marked differences, which can only be fully accounted for after trials extending through a number of years.

The following description accompanied the sample received from Maine:

No. XV. Crop of 1885, sampled from mow of pure timothy hay.

No. XXIII. Timothy from crop of 1886, cut when about ten days past full bloom, sampled from large lot. This and XV were grown on rather heavy clay lóam.

We do not know the history of the sample from Wisconsin, except that it was cut while in blóom.

Those from this Station were grown upon clay soil which had been laid down to grass for several years. The samples for both years were cut from the same plat and at the same stage of development, *i. e.*, in full bloom.

TIMOTHY.	Crude ash.	Albuminoids.	Crude fiber.	Nitrogen, free extract.	Fat, Ether extract.
From Wisconsin, 1886	6.36	8.75	38.85	42.40	3.62
Maine, 1885	5.24	7.56	36.22	48.20	2.78
Maine, 1886	4.01	5.81	35.45	52.01	2.72
Station, 1886	4.75	4.69	29.88	57.75	2.93
Station, 1887	5.54	8.12	30.65	52.62	3.07

The timothy from Maine, crop of 1885, was much richer in albuminoids than the crop of 1886, showing considerable variation in the hays for the two years. In comparing the three timothies of 1886, that from the New York Station is very deficient in albuminoid content, while that from Wisconsin is exceptionally high, but the proportion of fiber is also very high. Certain it is that meteorological influences modify largely the composition of the grasses, for the timothy grown at the Station for two years, 1886 and 1887, under like conditions, so far as soil and treatment were concerned, present such variations as can in no other way be accounted for.

The digestibility of the albuminoids of the several hays was determined, and their coëfficients are given below:

Timothy from	Per cent albuminoids digested.
Wisconsin, 1886	67.39
Maine, 1885	62.53
Maine, 1886	54.80
Station, 1886	56.08
Station, 1887	59.97

The hays having the largest albuminoid contents are also the most digestible, and this places the timothy from Wisconsin first in feeding value. We should expect that feeding experiments made with such hay would give results quite different from those obtained from the use of hay like that grown at this Station in 1886, or that from Maine. The Wisconsin hay has a "feeding ratio," for the dry substance, of 1:9.7, and that from this Station 1:19.3, differences so great that opposite conclusions might be reached by two experimentors using these hays in comparative feeding experiments.

Partial analyses of the ash from each of the several timothies were made, but since the results are tabulated elsewhere they need not be repeated here, for these analyses do not show the real differences that are made manifest when the ash constituents are calculated upon the water-free hays as is given in the next table, together with the per cent of nitrogen.

TIMOTHIES.	Phosphoric acid, P_2O_5.	Potash. K_2O.	Soda. Na_2O.	Nitrogen. N.
From Wisconsin, 1886.....	0.327	1.593	0.084	1.40
Maine, 1885.....	0.232	0.834	0.266	1.21
Maine, 1886.....	0.246	0.728	0.209	0.93
Station, 1886.....	0.179	1.097	0.066	0.75
Station, 1887.....	0.385	1.702	0.292	1.30

An inspection of the last table shows even greater differences in the ash constituents of the several hays than were found in the albuminoid content. This is especially true of the potash, for the hay from Maine for 1886 has less than half the amount that either of the other hays contain.

It is hoped that other samples of timothy may be secured and this interesting question of variation traced out until the real differences for locality shall have been determined.

COMPOSITION OF FORAGE PLANTS.

1. CACTUS OR PRICKLY PEAR.
2. PRICKLY COMFREY.

Among the forage plants which have been analyzed during the year, two deserve some notice from the importance which they may be made to assume in stock husbandry in the near future, one among ranchmen at the south, the other in the more closely cultivated regions of the north; the first, the prickly pear, growing extensively in the dry arid regions of the southwest; the other, prickly comfrey, which seems

to be especially adapted to the soiling system now being practiced more extensively in the older parts of our country.

CACTUS OR PRICKLY PEAR.

June 2, there was received from D. C. Richardson, New York city, a sample of prickly pear of the genus *Opuntia*, both top and stump, as grown in Texas. Mr. Richardson writes as follows regarding the habits and use of the plant:

> "The prickly pear grows from 3 to 6 feet in height and the plant spreads, covering a ground surface of 5 to 12 feet in diameter. It is considered by the natives to be in best condition for feeding from September to April. After the first of the latter month the sap commences rising. About August the pear-apple comes, which in itself has remarkable properties for fattening, but produces a soft flesh. The sample sent was cut about April 10, that is, the leaf, the piece of root or stump later, and no doubt the sap had commenced to run.
>
> My personal observation leads me to think that the plant is good for feeding any time of year, although the Mexicans say during the time sap is running it is better to cut off the young growing leaves and feed the lower portion, including the stump: in fact some ranchmen hold that the stump contains the most nutriment.
>
> About 5 to 7 lbs. cottonseed meal is fed to about one bushel of the plant cut up in small pieces so as to destroy the thorn. This amount is fed once a day, usually about 4 or 5 o'clock, so the animal will lie down after feeding. With above feed I know of 400 steers each taking on 350 lbs. flesh in 96 days. It is inclined to scour the cattle, although I have known them to live for months on it, there being nothing else for them to eat. Sheep will go three months without water by feeding on it.
>
> The past winter I kept a man employed singeing it over a fire, just burning the thorns off and being careful not to cook it. We saved about 100 head of old cows and calves in this way."

Although having been cut some time, the sample was in good condition, but the water was too much dried out to enable us to even approximate the amount contained in the plant as growing; therefore the analyses are calculated for the dry substance only.

	Top.	Stump.
Ash	22.79	15.78
Albuminoids	6.81	2.94
Crude fiber	14.99	22.54
Nitrogen-free extract	52.92	57.14
Fat (ether extract)	2.49	1.60

Per cent of albuminoids digested: Top, 60.64; stump, 10.88.

A partial examination of the nitrogen-free extract shows the plant to contain

	Top.	Stump.
Invert sugar	0	2.80
Sucrose	5.92	3.60
Starch	9.96	17.10

An examination of the large amount of mucilaginous substance present (particularly in the stump) showed it to be due to pectosic products, but no determination of the amount was made. The high per cent of ash led me to make a partial ash analysis, with results as follows:

	Top.	Stump.
Phosphoric acid, $P_2 O_5$	1.10	0.20
Potash, $K_2 O$	13.88	16.72
Soda, $Na_2 O$	10.56	13.64
Lime, Ca O	37.28	35.12
Magnesia, Mg O	4.20	4.01

We find it very deficient in phosphates, the bases being combined largely with organic acids or as carbonates.

The deficiency of nitrogenous matter (albuminoids) and the phosphates so essential for growing animals could be supplied readily with cottonseed meal and wheat bran. From the nature of the plant it seems that a machine so constructed as to thoroughly crush the plant would have advantages over one cutting the cactus into small pieces. By mixing the meal with the cactus while crushing, I should expect to secure the best results in feeding.

PRICKLY COMFREY.

June 25 there was received from Dr. Henry Foster, of Clifton Springs, a quantity of prickly comfrey for examination. On a previous visit at Dr. Foster's farm, where five acres of the plant were being grown for soiling, he informed me that he secured five crops each season and that he expected the produce from these five acres would furnish one-half of the fodder, other than grain, for his herd of fifty cows from May until October. He was then feeding two rations per day of corn ensilage and two of comfrey with mixed grains. The field certainly presented a most luxuriant growth of foliage at the time of my visit.

Under date of September 21 Dr. Foster wrote me as follows:

"We have been using comfrey five years, and we think more of its value this year than any previous year. We are now cutting the fifth crop grown this season. My foreman says that it will average ten tons to the acre for each crop, making fifty tons to the acre for the season. Of course to get such an enormous yield it must be thoroughly cultivated between each cutting and top-dressed. We use for dressing nothing but stable manure, put on immediately after cutting, before cultivating. We have no forage plant that compares with it in producing quantity and quality of milk."

The sample sent for analysis was just beginning to blossom. The comfrey is under trial at the Station the present season and analyses for both, together with one made three years ago, are given.

No. 1. Sample from Dr. Foster.

No. 2. Sample from Station crop.

No. 3. From report of 1884.

	No. 1.	No. 2.	No. 3.
Fresh Substance.			
Water	88.24	78.70	86.14
Ash	1.64	3.16	2.56
Albuminoids	1.88	3.69	3.25
Crude fiber	2.66	3.19	2.00
Nitrogen-free extract	5.27	10.42	5.68
Fat (ether extract)	.31	.84	.37
Dry Substance.			
Ash	13.93	14.83	18.45
Albuminoids	16.00	17.31	23.44
Crude fiber	22.66	14.98	14.43
Nitrogen-free extract	44.76	48.91	41.02
Fat (ether extract)	2.65	3.97	2.66

An inspection of the above table shows a large percentage of water for the fresh substance, while the water-free substance is much richer in albuminoids than the average feeding stuff. The per cent of ash is very large, which is generally characteristic of rapid-growing succulent plants.

SUGARS AND STARCH.

A determination of the sugars and starch was made in the sample received from Dr. Foster, with results as follows for the dry substance:

	Per cent.
Invert sugar	6.22
Sucrose	0.80
Starch	8.14

The plant contains a large per cent of invert sugar, but rather a small quantity of starch. The plant has very much the gelatinous

appearance which characterized the cactus, but as yet we have made no examination of this principle.

ALBUMINOID AND NON-ALBUMINOID NITROGEN.

The albuminoid nitrogen and amides were determined in the same sample, with results as below:

	Per cent.
Total nitrogen	2.56
Albuminoid nitrogen	2.37
Amide nitrogen	.19

The digestibility of the albuminoids we find quite low for sample No. 1, as shown by the following:

	Per cent.
Albuminoids digested	32.06

Time has not permitted a further examination of the samples, but enough is given to show that, from a chemical standpoint, we have in prickly comfrey a promising forage plant for those interested in soiling, and we would recommend its careful trial by the farmers of our State. For further remarks concerning prickly comfrey as a forage plant, the reader is referred to the report of my colleague, Mr. Plumb, who has made, during the present season, some careful experiments with a trial plat.

ANALYSES OF FODDERS.

During the past year an unusually large number of feeding stuffs have been analyzed, and the examinations have been made more complete than has been the case heretofore. The results of the most of these analyses are given and discussed under their appropriate heads, while some of a more or less miscellaneous nature are given in the first tables.

NOTES ON TABLE NO 1.

The analyses of a few feeding stuffs included in these tables have been taken from a former report, and such are marked with an asterisk. These analyses are repeated, as a more complete examination has been made since they were first published, in the way of ash analysis, and in some few a determination of the sugars and starch.

The grasses were all cut at time of full bloom, except the three included in No. 16.

No. 15 is the average of twenty-one analyses, given in full in another part of this report.

No. 16 is the average for three timothies cut after the seeds were formed July fourteen, but before the seed had matured.

No. 17 is the average of twenty-one analyses of clover, from plants differently fertilized, and were from the same source as No. 15.

No. 20 was a sample of ensilaged corn fodder, including the corn, sent on for analysis by W. C. Robinson, Hornellsville, N. Y. The corn was well glazed.

No. 21. A sample from the same source as last, and to all appearances the same.

No. 22. Ensilaged Hungarian grass from same source as last two.

No. 23. A sample of prickly comfrey received from Dr. Henry Foster, of Clifton Springs. For further remarks see "Forage Plants."

No. 24 was a sample of comfrey taken from the first growth from the Station trial plat.

Nos. 25 and 26 are discussed under the head of "Forage Plants."

No. 27. Alsike clover, from Orono, Maine.

Nos. 31–34. In this vicinity it is a common practice among grain growers to stack the straw in the field, so that the water content is larger than for sections where the crop is sheltered from the storms.

Nos. 37 and 38 were from Station-grown crop.

No. 39 was mixed wheats from Messrs. Coursey's flour mill.

No. 40 was a sample of flour from same firm as last.

Nos. 43, 44 and 47 were by-products from same source as No. 40.

No. 50 is the by-product from the manufacturer of corn hominy.

No. 51. This had the appearance of being a kiln-dried waste product from a starch factory. Sent on for examination by Mr. Clark, of Greymard, N. Y., who thought it contained a poison, several cows having died apparently from the effects of this feed.

No. 54. This was the common wild dandelion, growing abundantly upon the Station lawns. Broad-leaved type like the following one.

No. 55. The improved dandelion, grown by the Station, and was just at prime for cooking.

No. 56 was from the common pie-plant, of very succulent growth.

No. 57. Corn anthers holding the pollen.

Nos. 59–61. See description under "Edible Fungi."

No. 62. A sample of ragweed, *Ambrosia artemisiæfolia*. Sent on for analysis by E. W. Stewart, Lake View, N. Y.

Number.	FODDER.	FRESH SUBSTANCE.						DRY SUBSTANCE.				
		Water.	Ash.	Albuminoids, Nx 6.25.	Crude fiber.	Nitrogen free extract.	Fat (ether extract).	Ash.	Albuminoids, Nx 6.25.	Crude fiber.	Nitrogen free extract.	Fat (ether extract).
	GRASSES, ETC.											
1	Medium red clover*	75.63	1.55	3.66	6.86	11.08	1.22	6.38	15.00	28.16	45.46	5.00
2	Medium red clover	72.96	1.74	3.94	7.89	12.15	1.32	6.45	14.50	29.18	44.99	4.88
3	Alsike clover*	77.29	1.95	3.66	5.32	10.76	1.02	8.57	16.12	23.45	47.36	4.50
4	White clover*	78.23	1.79	4.42	4.70	9.44	1.42	8.24	20.31	21.60	43.33	6.52
5	Bokhara clover*	80.55	1.27	3.04	6.79	7.22	1.13	6.51	15.63	34.94	37.11	5.81
6	Lucerne*	56.73	3.77	6.49	14.81	16.47	1.73	8.71	15.00	34.24	38.04	4.01
7	Lucerne	70.91	2.64	5.39	9.91	10.23	.92	9.09	15.50	34.08	38.16	3.17
8	Yellow trefoil	78.52	1.37	3.40	6.31	9.29	1.11	6.40	15.81	30.31	42.31	5.17
9	Timothy	71.36	1.36	1.34	8.56	16.54	.84	4.75	4.69	29.88	57.75	2.93
10	Wood Meadow*	55.55	2.16	2.86	16.29	21.82	1.32	4.64	6.44	36.65	49.29	2.98
11	Rough-stalked meadow*	.....	.....	.....	.....	.....	.....	6.21	8.75	33.46	47.72	3.91
12	Chess*	60.35	1.83	3.17	13.05	20.46	1.12	4.67	8.00	32.91	51.60	2.82
13	Ox-eye daisies*	78.46	1.59	1.28	5.62	12.16	.89	7.38	5.94	26.10	56.47	4.11
14	Buttercup*	79.20	1.45	1.56	6.24	10.56	.99	7.02	7.50	30.00	50.72	4.76
15	Timothy, average 21	57.31	2.08	3.23	13.38	22.64	1.36	4.92	7.79	31.75	52.36	3.18
16	Timothy, average 3	48.14	2.25	3.28	18.16	26.72	1.45	4.32	6.31	35.03	51.55	2.79
17	Red clover, average 21	68.34	2.05	4.51	9.71	14.03	1.30	6.50	14.23	30.70	44.46	4.11
	GREEN FODDERS.											
18	Sorghum*	83.43	.74	1.04	5.76	8.56	.47	4.47	6.25	34.74	51.69	2.85
19	Fodder corn*	70.74	1.79	2.45	11.40	12.75	.87	6.12	8.38	39.01	43.51	2.98
20	Ensilage No. 1	60.72	1.65	3.54	7.83	23.90	2.36	4.20	9.00	19.94	60.84	6.02
21	Ensilage No. 2	57.86	1.79	3.71	8.39	25.69	2.56	4.24	8.81	19.92	60.96	6.07
22	Ensilage No. 3	60.51	2.75	3.30	13.60	17.51	2.33	6.96	8.37	34.45	44.32	5.90
23	Prickly comfrey	88.24	1.64	1.88	2.66	5.27	.31	13.93	16.00	22.66	44.76	2.65
24	Prickly comfrey	78.70	3.16	3.69	3.19	10.42	.84	14.83	17.31	14.98	48.91	3.97
25	Prickly pear, top	.....	.....	.....	.....	.....	.....	22.79	6.81	14.99	52.92	2.49
26	Prickly pear, stump	.....	.....	.....	.....	.....	.....	15.78	2.94	22.54	57.14	1.60

FODDER ANALYSES — (*Continued*).

Number.	FODDER.	FRESH SUBSTANCE.						DRY SUBSTANCE.				
		Water.	Ash.	Albuminoids. Nx 6.25.	Crude fiber.	Nitrogen free extract.	Fat (ether extract).	Ash.	Albuminoids. Nx 6.25	Crude fiber.	Nitrogen free extract.	Fat (ether extract).
	HAYS.											
27..	Alsike Clover	10.49	6.26	9.87	32.14	38.16	3.08	6.92	10.90	35.51	43.27	3.40
28..	Timothy, clover, etc.	9.32	6.19	9.25	32.13	39.85	3.26	6.77	10.12	35.12	44.43	3.56
29..	Hay	.....	.....	.....	.....	.....	.....	5.25	8.72	33.49	49.31	3.23
30..	Hay, mixed grasses	16.17	5.24	7.18	29.99	38.65	2.77	6.24	8.56	35.78	46.11	3.31
	STRAWS.											
31..	Wheat straw*	17.86	4.16	2.98	42.74	31.04	1.22	5.07	3.63	52.14	37.68	1.48
32..	Wheat chaff, hulls, etc.	25.62	9.13	2.79	26.49	35.01	.96	12.27	3.75	35.62	47.07	1.29
33..	Oat straw	16.28	4.83	2.35	36.77	37.97	1.80	5.80	2.81	43.92	45.32	2.15
34..	Oat chaff, hulls, etc.	11.54	16.26	5.80	24.05	39.80	2.55	18.38	6.56	27.19	44.99	2.88
35..	Corn fodder	39.02	4.38	2.86	21.72	30.78	1.24	7.19	4.69	35.62	50.46	2.04
36..	Corn fodder*	51.52	3.78	3.36	19.18	21.05	1.11	7.80	6.94	39.57	43.40	2.29
	GRAINS AND MEALS.											
37..	Oats	16.25	2.96	10.94	10.41	54.97	4.47	3.54	13.06	12.43	65.63	5.34
38..	Wheat*	12.80	1.40	13.00	3.76	67.40	1.64	1.60	14.93	4.31	77.28	1.88
39..	Wheat	13.83	1.74	10.61	2.43	69.74	1.63	2.02	12.31	2.84	80.94	1.89
40..	Flour	13.26	.38	10.50	1.21	73.62	1.03	.43	11.89	1.37	85.14	1.17
41..	Cernmeal	17.86	2.57	9.49	1.30	64.71	4.07	3.13	11.56	1.59	78.77	4.95
42..	Cornmeal*	16.96	1.39	8.56	1.98	66.92	4.19	1.67	10.31	2.38	80.60	5.04
	BY-PRODUCTS.											
43..	Wheat Middlings	14.04	3.45	16.44	3.56	57.69	4.82	3.93	18.75	4.06	67.77	5.49
44..	Wheat Bran	14.59	5.06	14.16	10.00	52.77	3.42	5.93	16.58	11.71	61.78	4.00
45..	Wheat Bran	.....	.....	.....	.....	.....	.....	7.17	16.84	11.65	59.65	4.69
46..	Wheat Bran	15.05	5.59	14.18	9.21	53.02	2.95	6.58	16.69	10.84	62.41	3.48
47..	Shipstuff	14.10	5.05	17.47	8.02	50.43	4.93	5.76	19.93	9.15	59.54	5.62
48..	Cottonseed Meal	.....	.....	.....	.....	.....	.....	7.34	52.09	6.21	23.72	10.64

49..	Linseed Meal	11.61	4.56	35.52	11.75	28.22	8.34	5.14	40.19	13.30	31.71	9.66
50..	Hominy Feed	12.06	2.61	11.56	5.02	63.31	5.44	2.92	12.95	5.62	72.42	6.09
51..	Gluten Meal	9.59	.85	21.92	5.54	51.77	10.33	.95	24.25	6.13	57.13	11.54
52..	Linseed Meal*	10.15	5.17	32.57	4.68	39.26	8.17	5.75	36.25	5.21	43.70	9.09
53..	Corncobs	21.55	1.55	1.22	31.60	43.84	.24	1.98	1.56	40.28	55.88	.30
	MISCELLANEOUS.											
54..	Dandelion, wild	88.32	1.74	2.86	1.69	4.67	.72	14.94	24.50	14.52	39.84	6.20
55..	Dandelion, improved	96.38	.62	.81	.59	1.39	.21	17.15	22.50	16.24	38.20	5.91
56..	Pie Plant	97.06	.48	.62	.65	1.10	.09	16.23	21.00	22.15	37.93	2.69
57..	Corn Anthers	.....	.....	.....	.....	.....	.....	5.76	17.19	10.03	65.97	4.05
58..	Castor Pomace	.....	.....	.....	.....	.....	.....	6.36	35.00	31.06	10.76	16.82
59..	Puff ball No. 1	92.18	.58	5.19	.89	1.05	.11	7.47	66.34	11.42	13.33	1.44
60..	Puff ball No. 2	.....	.....	.....	.....	.....	.....	6.97	57.44	11.07	22.05	2.47
61..	Mushrooms	89.15	.85	6.08	.76	2.37	.79	7.80	56.00	7.05	21.83	7.32
62..	Rag weed	.....	.....	.....	.....	.....	.....	8.69	15.44	31.46	38.70	5.71

ALBUMINOID AND NON-ALBUMINOID NITROGEN.

In a large majority of the fodders the albuminoid and non-albuminoid nitrogen was determined by Stutzer's cupric hydrate method, with such modifications as mentioned in my last report.

Number.		Date cut.	Total nitrogen.	Albuminoid nitrogen.	Amide nitrogen.	Per cent of total nitrogen in amide form
	GRASSES.					
1..	Medium red clover	June 9	2.40	1.92	.48	20.00
2..	Medium red clover	" 18	2.32	2.04	.28	12.07
3..	Alsike clover	" 9	2.58	2.05	.53	20.54
4..	White clover	" 12	3.25	1.18	2.07	63.59
5..	Bokhara clover	July 1	2.50	.94	1.56	62.40
6..	Lucerne	June 15	2.40	1.72	.68	28.33
7..	Lucerne	" 29	2.48	1.88	.60	24.18
8..	Yellow trefoil	" 11	2.53	1.75	.78	30.83
9..	Timothy	" 28	.75	.38	.37	49.33
10..	Wood meadow grass	" 15	1.03	.87	.16	15.53
11..	Rough-stalked meadow	" 19	1.40	.51	.79	56.42
12..	Chess	" 19	1.28	.43	.85	66.40
13..	Daisies	" 7	.95	.50	.45	47.37
14..	Buttercups	" 7	1.20	1.13	.07	5.83
15..	Timothy (average 21)	" 29	1.24	1.07	.17	13.71
16..	Timothy (average 3)	July 14	1.01	.83	.18	17.82
17..	Red clover (average 21)	June ..	2.28	2.02	.26	11.40
	GREEN FODDER.					
18..	Sorghum	.....	1	.71	.29	29.00
19..	Fodder corn	.....	1.34	.90	.44	32.83
23..	Prickly comfrey	.....	2.56	2.37	.19	7.42
25..	Prickly pear, top	.....	1.09	.49	.60	55.04
26..	Prickly pear, stump	.....	.47	.43	.04	8.51
	HAYS.					
29..	Hay	.....	1.39	1.21	.18	12.94
	STRAW.					
31..	Wheat straw	.....	.58	.53	.05	8.58
35..	Corn fodder	.....	.75	.75	.0	.0
36..	Corn fodder	.....	1.11	.84	.27	24.32
	GRAINS AND MEALS.					
38..	Wheat	.....	2.39	1.41	.98	41.00
39..	Wheat	.....	1.97	1.35	.62	31.47
40..	Flour	.....	1.68	.84	.84	49.39
	BY-PRODUCTS.					
43..	Wheat middlings	.....	2.63	1.92	.71	26.99
44..	Wheat bran	.....	2.65	2.05	.60	22.64
45..	Wheat bran	.....	2.69	2.09	.60	22.30
47..	Shipstuff	.....	2.80	2.19	.61	21.79
48..	Cottonseed meal	.....	8.34	7.90	.44	5.27
52..	Linseed meal	.....	6.43	6.15	.27	4.20
53..	Corn cobs	.....	.25	.24	.01	4.10
	MISCELLANEOUS.					
54..	Dandelion, wild	.....	3.92	2.72	1.20	30.61
55..	Dandelion, improved	.....	3.60	2.25	1.35	37.50

SUGARS AND STARCH.

In a few of the samples mentioned in this table of analyses, the sugars and starch have been determined by the method given under "Methods of Analysis." Where only starch appears in the table it includes the sugars, no separate determination of these having been made.

No.	SUBSTANCE.	Invert sugar.	Sucrose.	Starch.	Per cent of nitrogen free extract, as sugars and starch.
5	Bokhara clover	.....	.....	10.34	27.83
15	Timothy (average 21)	2.23	6.21	19.72	55.69
16	Timothy (average 3)	2.31	4.87	22.31	57.07
17	Red clover (average 21)	3.88	2.48	9.38	35.40
18	Sorghum	27.60	3.40	12.19	64.21
19	Fodder corn	9.00	.40	13.87	53.48
23	Prickly comfrey	6.22	.80	8.14	33.87
25	Cactus, top	.0	5.92	9.96	30.00
26	Cactus, stump	2.80	3.60	17.10	41.12
27	Alsike clover	.....	.....	14.63	33.81
29	Hay	.....	.....	24.32	49.32
30	Hay, mixed	.....	.....	20.90	45.33
31	Wheat straw	.....	.....	22.42	59.52
33	Oat straw	.....	.....	23.18	51.14
35	Corn fodder	2.50	1.43	22.88	53.32
37	Oats	.....	.....	53.20	81.05
39	Wheat	1.64	2.36	57.91	76.37
40	Flour	3.64	8.36	61.88	86.77
	Corn meal	.....	.....	71.97	88.69
43	Wheat middlings	3.20	6.40	41.44	75.31
44	Wheat bran	1.60	4.40	45.60	83.53
46	Wheat bran	.....	.....	50.54	80.98
47	Shipstuff	2.08	5.92	41.46	83.07

DIGESTIBILITY.

No.		Crude albuminoids, Nx 6.25.	True albuminoids.	Per cent undigested.	Per cent crude albuminoids digested.	Per cent true albuminoids digested.
	GRASSES, ETC.					
1..	Medium red clover	15.00	12.00	5.25	65.00	56.25
2..	Medium red clover	14.50	12.75	3.56	75.44	72.00
3..	Alsike clover	16.12	12.81	4.62	71.34	63.93
4..	White clover	20.31	7.38	5.06	75.08	31.43
5..	Bokhara clover	15.63	5.88	3.73	78.44	42.66
6..	Lucerne	15.00	11.75	4.06	72.93	65.44
7..	Lucerne	15.50	10.75	3.31	77.93	69.21
8..	Yellow trefoil	15.81	10.94	3.75	76.28	65.71
9..	Timothy	4.69	2.38	2.06	56.08	13.44
10..	Wood meadow	6.44	5.44	2.06	68.10	62.13
11..	Rough-stalked meadow	8.75	3.81	2.50	71.43	34.38
12..	Chess	8.00	2.69	2.25	71.87	16.36
13..	Daisies	5.94	3.13	4.25	28.45	.....
14..	Buttercups	7.50	7.06	3.50	53.33	50.42
15..	Timothy (average 21)	7.79	6.19	3.62	52.49	43.88
16..	Timothy (average 3)	6.31	5.54	4.06	39.39	.....
17..	Red clover (average 21)	14.23	12.65	6.03	57.62	52.33
	GREEN FODDERS.					
18..	Sorghum	6.25	4.44	2.63	57.92	40.76
19..	Fodder corn	8.38	5.63	3.94	52.98	30.01
20..	Ensilage No. 1	9.00	.....	3.13	65.22	.....
21..	Ensilage No. 2	8.81	.....	3.69	58.11	.....
22..	Ensilage No. 3	8.37	.....	3.25	61.18	.....
23..	Prickly comfrey	16.00	14.81	10.87	32.06	26.60
25..	Prickly pear, top	6.81	3.16	2.68	60.64	15.23
26..	Prickly pear, stump	2.94	2.69	2.62	10.88	.....
	HAYS.					
27..	Alsike clover	9.87	.....	4.88	50.50	.....
28..	Timothy, clover, etc	10.12	.....	3.56	64.82	.....
29..	Hay	8.72	7.56	4.89	44.00	35.31
30..	Hay, mixed grasses	8.56	.....	5.12	40.18	.....
	STRAW.					
31..	Wheat straw	3.63	3.31	2.75	25.27	16.91
32..	Wheat chaff, hulls, etc	3.75	3.69	2.50	33.33	32.52
33..	Oat straw	2.81	.....	2.31	17.79	.....
34..	Oat chaff, hulls, etc	6.56	.....	5.31	19.05	.....
35..	Corn fodder	4.69	4.68	3.25	30.55	30.55
36..	Corn fodder	6.94	5.25	3.19	54.03	39.23
	GRAINS AND MEALS.					
37..	Oats	13.06	.....	2.44	81.31	.....
38..	Wheat	14.93	8.81	1.93	87.07	78.09
39..	Wheat	12.31	8.44	1.50	87.81	82.22
40..	Flour	10.50	5.25	1.06	89.90	79.81
41..	Corn meal	11.56	.....	4.31	62.71	.....
42..	Corn meal	10.31	7.81	3.37	67.32	56.85
	BY-PRODUCTS.					
43..	Wheat middlings	16.44	12.00	1.75	89.35	85.41
44..	Wheat bran	16.58	12.81	2.81	83.03	78.06
45..	Wheat bran	16.84	13.06	3.55	78.92	72.81
46..	Wheat bran	16.69	.....	3.25	79.92	.....
47..	Shipstuff	17.50	13.68	2.81	83.94	79.46
48..	Cotton seed meal	52.09	49.37	7.38	85.84	85.05
50..	Hominy feed	11.56	.....	4.06	64.88	.....
52..	Linseed meal	40.19	.....	4.06	89.87	.....
53..	Corn cobs	1.56	1.50	1.06	32.05	29.20

ASH ANALYSIS.

No.		Ash.	Phosphoric acid, P_2O_5.	Potash. K_2O_3.	Soda, Na_2O.	Lime. Ca O.	Magnesia. Mg O.
1..	Medium red clover..	6.38	7.20	16.39	0.32	25.46	5.69
3..	Alsike clover.....	8.57	5.20	33.42	.....	25.93	4.62
4..	White clover	8.24	7.49	26.04	0.92	.....	.....
5 .	Bokhara clover.....	6.51	5.17	13.98	0.38	35.73	4.04
6..	Lucerne	8.71	6.29	18.84	1.15	37.07	2.16
8..	Yellow trefoil.....	6.40	7.88	18.00	2.78	33.36	3.56
9..	Timothy.....	4.75	4.41	27.02	1.62	.....	.....
10..	Wood meadow	4.64	6.50	18.32	11.34	.....	.....
11..	Rough-stalk'd m'dow	6.21	6.26	31.47	5.22	16.93	3.96
12..	Chess.....	4.67	6.38	17.45	.....	.....	.....
13..	Ox-eye daisies	7.38	4.32	35.70	1.01	.....	.....
14..	Buttercups	7.02	6.86	13.66	18.32	.....	.....
15..	Timothy (average 16)	4.99	5.93	34.19	5.45	8.69	1.93
16..	Timothy (average 3).	4.32	5.92	23.33	8.23	10.69	.....
17..	Red clover (av'ge 6)..	6.49	4.51	20.38	8.51	29.98	4.23
18..	Fodder corn.....	6.12	5.17	23.94	19.84	25.36	4.84
19..	Alsike clover	6.72	6.17	21.50	1.26	.....	.....
31..	Wheat straw	5.07	2.45	12.60	5.47	5.68	1.52
33..	Oat straw.....	5.80	1.17	27.76	4.82	9.28	.95
35..	Corn fodder	7.19	1.79	12.05	15.60	12.33	4.63
37..	Oats	3.54	41.68	12.53	1.13	3.33	2.63
38..	Wheat.....	1.60	44.08	18.73	1.12	.....	.....
39..	Wheat.....	2.02	47.93	27.98	6.16	4.19	6.76
40..	Flour.....	.43	52.32	30.94	2.60	7.40	4.45
42..	Corn meal.....	1.67	54.48	28.53	6.79	2.64	6.83
43..	Wheat middlings....	3.93	50.08	18.22	0.15	1.83	2.24
22..	Wheat bran	5.93	50.50	16.63	1.58	2.50	7.00
47..	Shipstuff.....	5.76	40.68	19.52	1.96	2.50	5.94
48..	Cottonseed meal.....	7.34	43.56	29.04	10.00	4.08	6.52
52..	Linseed meal.....	5.75	36.68	22.00	9.96	11.36	7.85
53..	Corn cobs	1.98	0.36	51.48	2.08	1.76	.96
25..	Prickly pear, top....	22.79	1.10	13.88	10.56	37.28	4.20
26..	Prickly pear, stump.	15.78	0.20	16.72	13.64	35.12	4.01
....	Beet, Mammoth Red	19.55	4.78	41.25	3.80	1.68	1.47

WHEAT AND ITS PRODUCTS.

1. WHEAT STRAW.
2. WHEAT GRAIN.
3. FLOUR.
4. MIDDLINGS.
5. SHIPSTUFF.
6. BRAN.
7. SUMMARY.

In the State of New York alone it is estimated that there were grown last year nearly 12,000,000 bushels of wheat. Therefore a study of the chemical composition of wheat and its products, and of the amount of fertilizing matter (nitrogen, phosphoric acid and potash) removed from the soil by the crop, becomes of direct interest, not only to the

producer from whose soil these ingredients are removed, but to the consumer as well, who desires to know what proportion of these elements of fertility he is returning to his own soil in the different products he may use as animal feed.

It is desirable to determine what is the average composition of wheats and the flour made from them for this section of our country, and to see in what direction efforts should be turned to improve the present varieties in order to produce the best quality of flour. This can only be done after we determine what variation there is for different years due to meteorological influences and variation in soils, for it has been shown by Richardson that environment very largely influences the quality of wheat. When these have been determined, then we may hope to be able to determine which factors, under our control, enter in to permanently improve the better flour-producing quality of wheats.

WHEAT STRAW.

Our analyses for straw having already been given, No. 31, in the preceding tables, need not here be repeated, but straw having a composition like the one we have examined, would contain in one ton, the following amounts:

	Pounds.	
Water	357.2	
Ash	83.2	
Albuminoids	59.6	
Crude fiber	854.8	
Nitrogen free extract	620.8	
Fat (ether extract)	24.4	
Starch and sugars		44.84
Nitrogen, N		11.20
Phosphoric acid, P_2O_5		2.67
Potash, K_2O		13.76
Lime, CaO		6.20

WHEAT GRAIN.

For analyses of wheats, see preceding tables, Nos. 38 and 39.

From the average of our analyses for New York grown winter wheat we find there would be removed per bushel, the following amounts:

	Pounds.
Water	7.93
Ash	.94
Albuminoids	7.08
Crude fiber	1.86

	Pounds.	
Nitrogen free extract	41.15	
Fat (ether extract)	.97	
Invert sugar, glucose, etc	.....	.784
Sucrose, etc	.....	1.416
Starch	.....	34.314
Nitrogen, N	.....	1.026
Phosphoric acid, $P_2 O_5$	.....	.454
Potash, $K_2 O$	.....	.265
Lime, Ca O	.....	.040

From experiments made at one of the mills using the Hungarian roller process, we are informed that one bushel (60 lbs.) of winter wheat, grown in this vicinity, furnished on the average about the following proportion of products:

	Pounds.
Flour	44
Middlings	4
Ship stuff	2
Bran	10

Samples of these different products were taken at the mill, and each has been carefully analyzed. These analyses, together with the above data, furnish us a means of estimating the amount of the different ingredients removed in the various products in one bushel of wheat, having a composition like the samples we have examined. The wheat from which these products were manufactured, was a mixture in about equal proportions of Clawson, Mediterranean and Early Amber.

Flour.

The analyses for this flour are given, No. 40 of the preceding tables. The flour, 44 pounds, from one bushel of wheat having a composition like the samples analyzed would contain the following amounts:

	Pounds per bushel of wheat.
Water	5.834
Ash	.167
Albuminoids	4.620
Crude fiber	.532
Nitrogen free extract	33.391
Fat (ether extract)	.453

Invert sugar, glucose, etc	1.601
Sucrose, etc	3.678
Starch, etc	27.227
Nitrogen, N	.739
Phosphoric acid, $P_2 O_5$	.092
Potash, $K_2 O$	.054
Lime, Ca O	.013

WHEAT MIDDLINGS.

The middlings form the inner coating of the wheat next the floury or starchy portion and contain portions of the germ and a larger per cent of nitrogen free extract, particularly starch, than either shipstuff or bran, and a less per cent of fiber, while the per cent of albuminoids usually stands between that of shipstuff and bran. The analysis No. 43, already given, furnishes the data for the following at 4 lbs. to the bushel of wheat:

	Pounds per bushel of wheat.	
Water	.562	
Ash	.138	
Albuminoids	.657	
Crude fiber	.142	
Nitrogen-free extract	2.307	
Fat (ether extract)	.193	
Invert sugar, glucose, etc		.128
Sucrose		.256
Starch		1.875
Nitrogen, N		.105
Phosphoric acid, $P_2 O_5$		.067
Potash, $K_2 O$		.024
Lime, Ca O		.002

SHIPSTUFF.

That part separated and known as shipstuff is a very thin layer next outside of the middlings, and contains the germ not found in the middlings or left as a part of the flour. The quantity produced, two pounds from a bushel of wheat, is very small and rarely kept separate from the bran. For analysis see preceding tables, No. 47.

	Pounds in bushel wheat.	
Water	.282	
Ash	.101	
Albuminoids	.349	
Crude fiber	.160	
Nitrogen free extract	1.088	
Fat (ether extract)	.099	
Invert sugar, glucose, etc	.....	.042
Sucrose	.....	.118
Starch	.....	.776
Nitrogen, N	.....	.056
Phosphoric acid, $P_2 O_5$	.....	.044
Potash, $K_2 O$	.....	.021
Lime, Ca O	.....	.003

BRAN.

Bran, the outer coating of the wheat, contains twice or three times as much fiber as does either of the other products from wheat, and proportionately less of each of the other ingredients except ash, which is greater, perhaps partly due to foreign matter adhering to the kernel. The analysis already given, No. 44, I need not repeat here, but give the amount removed by the bran (ten pounds) from one bushel of wheat:

	Pounds from bushel wheat.	
Water	1.459	
Ash	.506	
Albuminoids	1.416	
Crude fiber	1.000	
Nitrogen free extract	5.277	
Fat (ether extract)	.342	
Invert sugar, glucose, etc	.....	.160
Sucrose	.....	.440
Starch, etc	.....	4.644
Nitrogen	.....	.228
Phosphoric acid, $P_2 O_5$	.....	.251
Potash, $K_2 O$	.....	.083
Lime, Ca O	.....	.012

SUMMARY.

According to Richardson * the average per cent of water for American winter wheats is 10.16 against 13.22 for the samples we have ana-

* Bull. Department Ag., No. 4, p. 30.

lyzed, while the per cent of albuminoids,* according to the same authority, averages for America 12.15. For New York we find 11.80 per cent, but only approximate comparisons can now be made until a larger number of wheats have been analyzed, for in albuminoids the two wheats examined show a wide variation, and although grown in the same locality, but upon different soils, we cannot say whether this variation is due to difference in variety and soil or to meteorological influences, since they were grown in different years, for it has been shown that both may influence to a considerable extent the composition and physical properties of wheat.

Two-thirds of the nitrogen of the grain remains as a part of the flour, but of the mineral elements, phosphates, potash, etc., the larger proportion is left in the by-products, which are used as animal feeds, only about one-fifth of the phosphates being in the flour, the largest part being in the bran.

The high coëfficient of digestibility for the by-products from flour production renders them a most valuable source of animal feed, and at the same time so concentrated and rich are they in those elements necessary to a fertile soil that they become when properly managed a valuable source of fertilizers. From the foregoing we find that the milling products from one bushel of wheat having a composition like our sample would contain the following amounts of fertilizing matter, expressed in pounds:

	Nitrogen.	Phosphoric acid. $P_2 O_5$.	Potash. $K_2 O$.	Lime. $Ca O$.
Flour	.739	.092	.054	.013
Middlings	.105	.064	.024	.002
Shipstuff	.056	.044	.021	.003
Bran	.228	.251	.083	.012
Totals	1.118	.454	.182	.030

* Agricultural Science, Vol. I, No. 6, p. 126.

Or we may express the results in another form, calculating the amount contained in one ton of straw and the products of thirty bushels of wheat, expressing the amounts in pounds, as follows:

	Nitrogen.	Phosphoric acid P_2O_5.	Potash. K_2O.	Lime. CaO.
Straw	11.20	2.67	13.76	6.20
Flour	22.17	2.76	1.62	.39
Middlings	3.15	2.01	.72	.06
Shipstuff	1.68	1.32	.63	.09
Bran	6.84	7.53	2.49	.36
Totals	45.04	16.29	19.22	7.10

During another year we hope to be able to further study the variation in, and influence of soil and fertilizers upon, the composition of wheat, together with the meteorological influences.

PER CENT OF WATER IN SOME FARM PRODUCTS.

1. VARIETIES OF GRASS IN FULL BLOOM.
2. IN HAY, STORED IN MOWS.
3. IN FODDER CORN.
4. IN CORN FODDER; STOVER.
5. IN CORN MEAL.

No exact data seems to be accessible as to the per cent of water contained in many of our common feeding stuffs, in different localities and at different times in the year. That the amount varies for localities and for different years in the same locality, as well as for the different seasons of the year according to time from harvesting, there is little question.

A few determinations of the water in various products have been made from time to time during the past two years, and some of the results are given in this topic.

WATER IN GRASSES IN FULL BLOOM.

For two years I have taken for analysis samples of different grasses at the period of full bloom, and give in parallel columns the per cent of water as determined at that time. The samples were taken at the same place each year and were mostly from the Station grass-plats:

	Per cent of water. 1886.	1887.
Timothy (Herdsgrass)	71.36	59.85
Orchard grass	65.00	73.19
Tall Meadow oat grass	69.07	69.86
Fort Bellingham	61.78	63.38
Reed Canary grass	65.23	66.52
Meadow Fescue	68.70	66.52
Lucerne: Alfalfa	56.73	70.91
Medium Red Clover	75.63	72.96

It will be observed from the above table that there may be a considerable variation in the amount of water for the same kind of grass for different years at the same stage of growth, also between the different varieties for the same year, but, on the whole, the amount of water in the grasses at date of harvesting was greater in 1887 than in the preceding year.

AMOUNT OF WATER IN HAY.

The amount of water contained in hay, in mows, during the feeding season, is one of considerable importance, especially to those who have to buy hay, and probably varies according to locality. I have brought together here the data gathered from my own determinations, using only those results where the conditions of sampling were known, and the most of the samples were taken for the purpose of water determination. Considerable of the surface hay was removed before taking the sample, in order to avoid, as far as possible, surface hygroscopic influences. The hays were dried at about 100° C, until the weight was constant and the loss calculated as water:

		Per cent of water.
September	3. Clover and timothy	14.77
November	4. Mixed hay, two years in mow	16.04
November	29. Hay from mow, loft of barn	15.41
January	31. Hay from mow	14.98
February	1. Hay from mow, loft of barn	16.27
February	7. Hay from horse barn	15.35
February	24. Hay in mow, one year past	13.94
March	4. Hay from horse barn	16.02

The above for a single year's determination shows for hay in the locality of the Station as found in mows an average of 15.35 per cent of water, a minimum of 13.94 (old hay) and a maximum of 16.27 per cent.

FODDER CORN.

The water content of fourteen samples of fodder corn was determined at the period of growth when cut for filling the silo, several varieties being represented by the different plats. Without giving each determination in full, the following summary is presented:

	Per cent of water.
Average	82.14
Maximum	86.83
Minimum	69.28

CORN FODDER: STOVER.

Determinations of the amount of water in corn fodder have been made at irregular intervals from the time of harvesting in the fall until spring. The first one is for a sample taken in the field at the time of husking the corn; the others are a series of determinations made with samples taken from the same general pile, stored for feeding in the experiment barn loft. A bundle of stalks was run through a feed cutter, the whole well mixed and then sampled:

	Per cent of water.
October 12	51.52
November 3	34.98
November 29	39.19
December 17	31.29
January 6	28.65
January 18	28.88
January 31	33.14
February 7	33.54
February 24	25.92
March 28	26.12

CORN MEAL.

The per cent of water in corn meal varies considerably, according to the method of storage for the corn and the time from harvesting. In each case the date at which the sample was taken is given, and these were taken at irregular periods from time of harvesting through the year. The determinations are for all the meals analyzed, and include both that made from Station-grown corn and that purchased for feeding, and are not all for the same year, but are arranged according to the dates:

	Per cent of water.
October 27	25.55
December 18	27.41
December 28	16.96
January 9	22.56
February 3	23.14
February 14	17.86
March 17	15.80
April 17	11.09
July 10	10.25
July 1	8.01
July 6	11.00
July 6	9.63
August 6	9.29
September 11	10.25

The corn meals under date of August 6 were from different varieties of corn which had been spread upon the chamber floor in the barn since harvesting and in a most favorable condition for a minimum amount of moisture. Those under date of October 27, December 28 and April 17 were from samples from the same corn put up in traces at time of harvesting and hung to the rafters in the barn loft.

NEW vs. OLD HAY AND GRAIN.

A sample of timothy hay, the crop of 1886, of which a portion had been analyzed and the digestibility of its albuminoids determined in the early winter of 1886, was put in a cotton bag and hung up in the barn loft, where it remained until October, 1887, when it was examined as to the digestibility of its albuminoids. The result of this examination was as follows:

	Per cent of albuminoids digested.
New hay	67.39
Old hay	55.10

From the above we find that the nutritive value of the hay was considerably diminished on long keeping, and this led us to make similar examinations of samples of wheat and of wheat bran that had been ground and kept in the laboratory in glass-stoppered bottles for ten months:

	Per cent digested.	
	Fresh.	Old.
Wheat bran	83.03	77.37
Wheat	87.81	79.20

We find that the digestibility of wheat and bran has also been considerably diminished by keeping, and while we have made no further investigations as to other changes or digestibility of constituents other than albuminoids, yet from previous experiments there seems good reason for believing that the fats at least would be found less digestible in the old grains than in the fresh grains themselves, especially if they have been reduced to meal. The amount of fats* soluble in either is markedly less in grains eighteen months old than in those but a short time from harvesting and freshly ground.

The insolubility of the oils in ether is due to their oxidation, and it seems probable that they would be found also less digestible. Should further investigation confirm these trials this would furnish an explanation for the decreased value of old hay and grain over that in the winter immediately following its harvesting, a fact long recognized by the farmer, but often overlooked by the chemist.

INFLUENCE OF FERTILIZERS UPON THE COMPOSITION OF TIMOTHY AND CLOVER.

In order to study the influence of various fertilizing substances upon the composition of grasses, a lot was selected in a field which had already been down to grass for five years. This lot was divided into twenty-one plats, each ten by fifteen feet, and different fertilizing ingredients applied to the several plats, in the proportion indicated by the first table.

There are but few questions of greater importance to the agriculturist, or more difficult of investigation for the agricultural chemist, than that for determining the influence of the various fertilizing elements through the soil upon the composition and digestibility of our feeding stuffs. Few agricultural problems can be more complex, and have more influencing factors entering in to modify the results, than we find in this line of work. Soil, temperature, rainfall, evaporation, sunshine, locality, etc., each influences the growth and composition of plants, and only after a long series of experiments can any investigation in this direction lead to definite conclusions. From this year's results we do not expect to be able to settle any mooted questions, but rather to add cumulative data, which shall ultimately help throw light upon such questions as the influence which the various fertilizers, singly and combined, exert in the soil, and through the soil upon the plant.

* See report New York Agricultural Experiment Station, 1885, p. 319.

The fertilizers were mixed with fine, dry sand before being applied in order to insure a more uniform distribution over the surface of the plats. The lot selected for experiment was as nearly uniform in general appearance at time of sowing the fertilizers, May 3, as could have been expected.

FERTILIZER—POUNDS PER ACRE.

PLAT.	Sulphate of potash.	Muriate of potash.	Sulphate of ammonia.	Nitrate of soda.	Acid phosphate.	Ferrous sulphate.	Lime.	Gypsum.	Sodium chloride.
I	300	....	....	....	....	....	....	....	....
II	....	....	150	....	....	....	....	....	....
III	....	....	....	....	350	....	....	....	....
IV	300	....	150	....	350	....	....	....	....
V	300	....	....	....	350	....	....	....	....
VI	....	....	150	....	....	....	....	....	....
VII	....	....	150	....	350	....	....	....	....
VIII	....	....	150	....	350	....	350	....	....
IX	300	....	150	....	....	....	350	....	....
X	300	....	150	...	350	....	350	....	....
XI	....	....	150	....	....	....	350	550	....
XII	300	....	150	....	350	....	....	550	....
XIII	....	....	....	....	....	....	350	....	....
XIV	....	....	....	....	....	....	....	550	....
XV	....	....	....	....	....	....	....	....	....
XVI	....	....	....	....	....	....	....	....	100
XVII	....	....	....	180	....	....	....	....	....
XVIII	....	....	150	....	....	....	....	....	....
XIX	....	150	....	....	....	....	....	....	....
XX	300	....	....	....	....	....	....	....	....
XXI	....	....	....	....	....	50	....	....	....

The lot, like the surrounding field, was covered with a good growth of timothy and some red clover. The application of the nitrogenous fertilizers tended to stimulate the growth of the clover, so that on those plats where nitrogen was applied, there was a large increase in the proportion and growth of the clover.

The notes taken under date of June 9 will indicate the general appearance of the plats at that date.

No. 1. Grass nearly the same in general appearance as the surrounding field.

No. 2. Grass thicker, further advanced, and of a deeper color, with more clover than in No. 1.

No. 3. In appearance more nearly as No. 1.

No. 4. Resembles No. 2.

No. 5. Not nearly so good as No. 4, but better than No. 1.

No. 6. Some better than last.

No. 7. Not so good as No. 5.

No. 8. Color pale for timothy, but a good growth.

No. 9. Not so good as last. Color about the same.

No. 10. Very good. Stronger growth than No. 2, but not so far advanced.

No. 11. Smaller growth, and not so thick, but in appearance better than No. 1.

No. 12. Not so good as No. 10.

No. 13. Very poor growth of timothy, and but few heads as yet appearing, with but very little color.

No. 14. Better than the last.

No. 15. Color pale, but growth superior to 13.

No. 16. In appearance not so good as 15, but color rather better.

No. 17. Thickest growth in lot, deepest color, but not so far advanced as the others.

No. 18. Good color, but in all respects far behind No. 17.

No. 19. About as No. 1.

No. 20. No noticeable difference from last.

No. 21. Resembles the last two, or about the same as surrounding field.

These notes are given to show the general impression on carefully looking over the plats, and the relative positions which they held at this date was not materially changed at time of taking the samples. As would be expected in dealing with a large number of plats receiving different treatment, they could not all be collected in exactly the same stage of growth on any one date, but at time of sampling they were all as nearly in full bloom as was possible to have them at any one time.

RED CLOVER HAY.

June 23, the samples of red clover were taken for analysis. The whole plant above ground was taken, and a sufficiently large sample to insure having a fair representative of the plat. The samples were carefully dried at 100 C., then ground and preserved for analysis.

RED CLOVER.

PLAT.	FRESH SUBSTANCE.						WATER-FREE.				
	Water.	Ash.	Albuminoids Nx 6.25.	Crude fiber.	Nitrogen free extract.	Fat (ether extract).	Ash.	Albuminoids Nx 6.25.	Crude fiber.	Nitrogen free extract.	Fat (ether extract).
I	67.45	1.98	4.54	9.19	15.50	1.34	6.10	13.94	28.23	47.62	4.11
II	65.97	2.15	4.44	10.35	15.80	1.29	6.32	13.06	30.41	46.31	3.80
III	67.20	2.20	4.76	10.13	14.41	1.30	6.71	14.50	30.89	43.93	3.97
IV	69.91	2.02	4.55	9.64	12.64	1.24	6.73	15.11	32.03	41.99	4.14
V	69.77	2.05	4.38	9.04	13.50	1.26	6.79	14.50	29.91	44.62	4.18
VI	68.10	2.06	4.53	10.70	13.34	1.27	6.47	14.19	33.56	41.81	3.97
VII	65.83	2.15	5.06	11.31	15.26	1.39	6.28	14.81	30.19	44.66	4.06
VIII	67.43	2.06	4.82	9.78	14.44	1.27	6.32	14.81	30.02	44.94	3.91
IX	68.42	2.07	4.34	9.51	14.30	1.36	6.55	13.75	30.11	45.29	4.30
X	71.15	1.89	4.34	8.46	13.01	1.15	6.56	15.06	29.32	45.07	3.99
XI	70.10	1.99	4.30	8.68	13.96	.97	6.67	14.37	29.04	46.67	3.25
XII	68.37	2.10	4.21	9.05	15.12	1.15	6.64	13.31	28.63	47.77	3.65
XIII	66.54	2.15	4.27	10.57	14.93	1.34	6.42	12.75	31.59	44.63	4.61
XIV	68.64	2.03	4.00	9.83	14.24	1.23	6.50	12.75	31.36	45.47	3.92
XV	71.02	1.80	3.80	8.83	13.38	1.17	6.23	13.12	30.48	46.14	4.03
XVI	68.10	2.15	4.76	10.04	13.82	1.13	6.74	14.94	31.49	43.27	3.56
XVII	69.80	1.91	4.21	9.16	13.62	1.30	6.33	13.94	30.35	45.07	4.31
XVIII	69.66	2.05	4.44	8.95	13.59	1.31	6.76	14.62	29.50	44.80	4.32
XIX	66.37	2.26	5.63	10.84	13.45	1.45	6.72	16.75	32.25	39.98	4.30
XX	66.80	2.12	4.67	10.94	13.71	1.76	6.39	14.06	32.97	41.29	5.29
XXI	68.67	1.97	4.58	10.15	13.19	1.44	6.28	14.62	32.40	42.10	4.60
Average	68.34	2.05	4.51	9.77	14.03	1.30	6.50	14.23	30.70	44.46	4.11

ALBUMINOID AND NON-ALBUMINOID NITROGEN.

The albuminoid and non-albuminoid nitrogen of the clover was determined for each plat by Stutzer's method, and the results are given below:

PLAT.	Total nitrogen.	Albuminoid nitrogen.	Amide nitrogen.	Per cent of total nitrogen in amide form.
I	2.23	2.13	.10	4.48
II	2.09	1.99	.10	4.78
III	2.32	2.04	.28	12.07
IV	2.42	2.08	.34	14.05
V	2.32	2.11	.21	9.05
VI	2.27	1.99	.28	12.33
VII	2.37	2.18	.19	8.01
VIII	2.37	2.13	.24	10.12
IX	2.20	2.01	.19	8.63
X	2.41	2.13	.28	11.61
XI	2.30	1.94	.36	15.65
XII	2.13	2.01	.12	5.63
XIII	2.04	1.75	.29	13.72
XIV	2.04	1.94	.10	4.90
XV	2.10	1.87	.23	10.95
XVI	2.39	2.16	.23	9.62
XVII	2.23	2.08	.15	6.72
XVIII	2.34	2.08	.26	11.11
XIX	2.68	1.99	.69	25.74
XX	2.25	1.88	.37	16.44
XXI	2.34	2.06	.28	11.96
Average	2.28	2.02	.26	11.40

SUGARS AND STARCH.

In each case the per cent of sugars and starch was determined in the dry substance, by the method indicated in another topic, and for convenience the terms invert sugar, sucrose and starch will be used.

PLAT.	Invert sugar.	Sucrose.	Starch.	Per cent of nitrogen free extract, as sugar and starch.
I	4.08	2.60	9.88	34.77
II	3.52	2.16	9.23	32.19
III	4.60	2.20	5.58	27.72
IV	5.20	1.20	8.04	34.39
V	5.00	.88	10.52	36.75
VI	5.60	2.40	6.46	34.57
VII	2.60	3.80	10.41	37.64
VIII	3.20	2.04	9.25	32.24
IX	4.80	2.12	8.43	33.89
X	4.20	2.88	9.80	37.42
XI	4.00	2.96	10.79	38.03
XII	2.64	2.24	13.90	39.31
XIII	3.40	1.80	12.35	39.32
XIV	3.80	4.40	6.08	31.40
XV	4.00	3.40	9.04	35.63
XVI	3.20	3.92	7.22	33.14
XVII	3.32	1.72	11.32	36.29
XVIII	4.00	2.20	11.40	39.28
XIX	3.60	2.40	6.84	32.11
XX	3.20	2.00	12.92	43.88
XXI	3.60	2.80	7.48	32.97
Average	3.88	2.48	9.38	35.40

DIGESTIBILITY.

The digestibility of the albuminoids was determined in each case by pepsin digestion. A marked difference in digestibility is shown for the different plats, the coëfficient ranging from 38 to 72 per cent.

PLAT.	Total albuminoids.	True albuminoids.	Per cent undigested.	Per cent total albuminoids digested.	Per cent true albuminoids digested.
I	13.94	13.21	8.31	40.39	37.09
II	13.06	12.44	5.75	55.97	53.78
III	14.50	12.75	5.31	63.37	58.35
IV	15.11	13.00	5.75	61.94	55.77
V	14.50	13.19	9.00	37.93	31.76
VI	14.19	12.44	4.87	66.45	60.85
VII	14.81	13.62	6.50	56.11	52.24
VIII	14.81	13.21	6.63	55.23	49.81
IX	13.75	12.56	4.87	64.58	61.22
X	15.06	13.31	4.12	72.64	69.04
XI	14.37	12.12	5.75	59.98	52.56
XII	13.31	12.56	5.19	61.00	58.67
XIII	12.75	10.94	7.25	43.13	33.73
XIV	12.75	12.12	5.50	56.73	54.62
XV	13.12	11.69	5.62	57.16	51.92
XVI	14.94	13.50	5.31	63.79	60.66
XVII	13.94	13.00	6.12	56.09	52.92
XVIII	14.62	13.00	6.44	55.95	50.46
XIX	16.75	12.44	6.12	63.46	50.80
XX	14.06	11.75	6.56	53.34	44.17
XXI	14.62	12.87	5.62	61.56	56.33
Average	14.23	12.65	6.03	57.62	52.33

ASH ANALYSIS.

In a few of the samples the principal ash constituents were determined and are given in the following table:

PLAT.	Ash.	Phosphoric acid. P_2O_5.	Potash. K_2O.	Soda. Na_2O.	Lime. Ca O.	Magnesia Mg O.
I.....	6.10	3.73	16.60	16.76	27.28	4.16
II.....	6.32	2.92	18.24	5.64	33.44	4.29
III.....	6.71	6.08	16.64	10.64	36.40	5.16
IV.....	6.73	5.57	28.03	7.56	25.20	3.50
V.....	6.79	4.96	19.40	3.28	29.44	3.28

ASH CONSTITUENTS CALCULATED IN DRY SUBSTANCE OF HAY.

The results can best be compared if the ash elements be calculated upon the hay itself, thus enabling us to trace real differences, which may not exist in the ash composition itself.

PLAT.	Phosphoric acid. O_2P_5.	Potash. K_2O.	Soda. Na_2O.	Lime. Ca O.	Magnesia. Mg O.	Nitrogen.
I.....	227	1.013	1.022	1.664	.254	2.23
II.....	.184	1.153	.356	2.113	.271	2.09
III.....	.408	1.116	.714	2.342	.346	2.32
IV.....	.375	1.886	.509	1.696	.235	2.42
V.....	.337	1.317	.233	1.999	.233	2.33

TIMOTHY.

June 29, the samples of timothy were taken for analysis, and the data from the results are given in the following table:

Analysis of Timothy.

	Fresh Substance.						Water Free.				
	Water.	Ash.	Albuminoids Nx 6.25.	Crude fiber.	Nitrogen free extract.	Fat (ether extract).	Ash.	Albuminoids Nx 6.25.	Crude fiber.	Nitrogen free extract.	Fat (ether extract).
I.	60.86	1.69	2.72	12.18	21.47	1.18	4.33	6.94	31.13	54.57	3.03
II.	55.32	1.83	3.35	14.49	23.79	1.22	4.09	7.50	32.43	53.25	2.73
III.	58.12	2.14	3.14	13.69	21.38	1.53	5.11	7.50	32.70	51.04	3.65
IV.	58.60	1.97	3.49	14.08	20.48	1.38	4.76	8.43	34.00	49.47	3.34
V.	59.13	2.14	3.58	13.95	19.71	1.49	5.23	8.75	34.13	48.25	3.64
VI.	57.32	1.85	3.41	13.92	22.39	1.11	4.33	8.00	32.61	52.46	2.60
VII.	56.27	2.12	3.36	13.52	23.40	1.33	4.84	7.69	30.91	53.51	3.05
VIII.	54.98	1.93	2.52	14.12	24.08	1.37	4.29	7.81	31.37	53.48	3.05
IX.	57.19	2.06	3.17	12.99	23.38	1.21	4.81	7.43	30.34	54.60	2.82
X.	55.91	2.28	3.64	13.49	23.26	1.42	5.18	8.25	30.61	52.75	3.21
XI.	56.14	2.23	3.37	14.15	22.55	1.56	5.08	7.69	32.26	51.41	3.55
XII.	55.79	2.28	3.73	14.11	22.69	1.49	5.15	8.44	31.91	51.16	3.34
XIII.	60.18	2.09	3.06	12.83	20.56	1.28	5.25	7.69	32.23	51.61	3.22
XIV.	58.38	2.06	2.91	13.20	22.29	1.16	4.96	7.00	31.72	53.54	2.78
XV.	59.85	2.22	3.26	12.30	21.14	1.23	5.54	8.12	30.65	52.62	3.07
XVI.	59.36	2.24	3.68	12.65	20.59	1.49	5.51	9.06	31.12	50.64	3.67
XVII.	57.14	2.12	3.40	13.58	22.39	1.37	4.96	7.94	31.69	52.20	3.21
XVIII.	59.91	2.07	2.78	12.50	21.33	1.41	5.06	6.94	31.18	53.29	3.53
XIX.	59.77	2.23	3.14	12.74	20.84	1.28	5.54	7.81	31.67	51.80	3.18
XX.	58.59	2.00	2.95	12.54	22.50	1.42	4.84	7.12	30.28	54.32	3.44
XXI.	56.03	1.99	3.27	14.05	23.03	1.63	4.52	7.44	31.95	52.37	3.71
Average.	57.31	2.08	3.23	13.38	22.64	1.36	4.92	7.79	31.75	52.36	3.18

ALBUMINOID AND NON-ALBUMINOID NITROGEN.

The following table shows the variation in per cent of albuminoid and non-albuminoid nitrogen, together with the average for the plats:

PLAT.	Total nitrogen	Albuminoid nitrogen.	Amide nitrogen	Per cent of total nitrogen in amide form.
I	1.11	.95	.16	14.41
II	1.20	.95	.25	20.83
III	1.20	.95	.25	20.83
IV	1.35	1.17	.18	13.33
V	1.40	1.01	.39	27.25
VI	1.28	1.20	.08	6.25
VII	1.23	1.06	.17	13.82
VIII	1.25	1.22	.03	2.40
IX	1.19	1.14	.05	4.20
X	1.29	1.09	.20	15.60
XI	1.23	1.18	.05	3.99
XII	1.35	.90	.45	33.33
XIII	1.23	1.06	.17	13.82
XIV	1.12	1.06	.06	5.35
XV	1.30	.92	.38	29.23
XVI	1.45	1.03	.42	28.98
XVII	1.27	1.27	.00	.00
XVIII	1.11	1.09	.02	1.80
XIX	1.25	1.20	.05	4.00
XX	1.14	.98	.16	14.03
XXI	1.19	1.01	.18	15.12
Average	1.24	1.07	.17	13.71

SUGARS AND STARCH.

The per cent of sugars and starch for the dry substance of the hays from the several plats, are given in the following table:

PLAT.	Invert sugar.	Sucrose.	Starch.	Per cent of nitrogen free extract, as sugars and starch.
I	2.40	5.88	21.20	53.05
II	2.76	7.20	19.19	54.74
III	3.92	5.80	19.00	56.27
IV	3.60	7.60	18.12	59.27
V	2.82	7.04	19.22	61.81
VI	3.60	6.36	22.61	62.08
VII	2.80	7.48	17.55	46.40
VIII	2.32	6.40	20.33	54.31
IX	2.48	7.00	22.04	63.22
X	2.40	5.80	20.29	54.01
XI	3.16	4.72	18.88	52.05
XII	3.20	5.48	19.00	54.10
XIII	5.00	7.32	18.96	60.61
XIV	3.56	5.36	20.52	54.98
XV	3.72	5.96	18.67	52.73
XVI	3.60	5.40	19.95	57.17
XVII	3.44	5.56	20.63	56.76
XVIII	3.20	6.20	17.78	51.00
XIX	3.04	4.68	19.45	52.46
XX	2.96	6.00	19.72	52.79
XXI	3.80	7.28	19.00	57.36
Average	3.23	6.21	19.72	55.69

DIGESTIBILITY.

The digestion coëfficient for the albuminoids of each sample of hay is given below:

PLATS.	Crude Albuminoids Nx 6.25.	True albuminoids.	Albuminoids undigested.	Per cent crude albuminoids digested.	Per cent true albuminoids digested.
I	6.94	5.92	3.75	45.96	36.65
II	7.50	5.92	3.37	55.06	43.07
III	7.50	5.94	3.75	50.00	36.86
IV	8.43	7.31	3.87	54.09	47.06
V	8.75	6.31	2.94	66.40	53.40
VI	8.00	7.50	3.87	51.62	49.73
VII	7.69	6.63	3.87	49.67	41.63
VIII	7.81	7.62	3.56	54.41	50.28
IX	7.43	7.12	3.56	52.08	50.00
X	8.25	6.81	3.25	60.60	52.26
XI	7.69	7.17	4.06	47.20	43.37
XII	8.44	5.63	3.87	54.14	31.26
XIII	7.69	6.63	3.38	56.01	49.03
XIV	7.00	6.63	3.37	51.85	49.17
XV	8.12	5.75	3.25	59.97	43.47
XVI	9.06	6.44	3.75	58.60	41.77
XVII	7.94	7.94	4.44	43.91	44.08
XVIII	6.94	6.81	3.38	48.70	36.68
XIX	7.81	7.50	3.75	50.70	50.00
XX	7.12	6.12	3.25	54.35	46.89
XXI	7.44	6.31	3.37	54.70	46.59
Average	7.79	6.19	3.62	52.49	43.88

ASH ANALYSES.

Partial analyses of the ash from sixteen of the timothies were made, and the results are tabulated below:

PLAT.	Ash.	Phosphoric acid. P_2O_5	Potash. K_2O	Soda. Na_2O	Lime. CaO	Magnesia. MgO
I	4.33	5.52	33.04	10.76	8.56	2.20
II	4.09	3.73	27.56	6.99	9.92	1.96
III	5.11	5.00	32.32	2.56	7.52	1.96
IV	4.76	6.44	33.77	5.36	8.24	1.85
V	5.23	7.40	35.21	3.47	.....	1.71
VI	4.33	4.96	32.88	4.48	8.64	2.53
VII	4.84	8.46	34.16	8.01	14.00	1.84
XIII	5.25	5.12	31.96	2.64	7.44	1.87
XIV	4.96	4.34	36.08	7.96	7.92	1.96
XV	5.54	6.95	30.72	5.28	10.00	2.24
XVI	5.51	5.63	34.72	5.58	8.80	.95
XVII	4.96	.....	32.96	3.48	9.84	1.76
XVIII	5.06	6.55	34.96	5.28	8.56	1.85
XIX	5.54	6.14	29.96	.....	7.76	2.04
XX	4.84	6.67	39.92	4.72	7.36	2.08
XXI	4.52	5.99	36.87	5.24	6.96	2.12

ASH CONSTITUENTS, CALCULATED IN DRY SUBSTANCE OF HAYS.

PLAT.	Phosphoric acid. P_2O_5	Potash. K_2O	Soda. Na_2O	Lime. CaO	Magnesia. MgO	Nitrogen.
I	.238	1.431	.466	.371	.095	1.11
II	.153	1.127	.286	.406	.080	1.20
III	.255	1.651	.131	.384	.100	1.20
IV	.316	1.607	.255	.403	.088	1.35
V	.387	1.841	.181	.....	.089	1.40
VI	.215	1.424	.194	.374	.109	1.28
VII	.409	1.653	.388	.677	.089	1.23
XIII	.269	1.678	.138	.390	.097	1.23
XIV	.215	1.789	.395	.323	.097	1.12
XV	.384	1.702	.292	.554	.125	1.30
XVI	.310	1.913	.307	.485	.052	1.45
XVII	.....	1.635	.173	.488	.087	1.27
XVIII	.331	1.769	.267	.433	.105	1.11
XIX	.340	1.660	.....	.430	.113	1.25
XX	.323	1.448	.228	.356	.100	1.14
XXI	.271	1.666	.237	.314	.096	1.19

The results obtained from the experiments of this year, to determine the influence of fertilizers upon the composition of timothy and clover, show us nothing as to the possible influence of fertilizers. The soil upon which we are experimenting, it seems, is sufficiently rich to produce good crops, under favorable conditions, without the use of fertili-

zers for immediate effect. The timothy hay grown upon the unfertilized plat, XV, was richer in albuminoids and nitrogen free extract than was the average for the entire plats, although many of them were heavily fertilized. The greatest variation in the composition of the timothies, differently fertilized, is far less than the variation in the chemical composition of timothy for two successive years of growth upon the same plats, under like conditions and without fertilizers, so far as field culture furnishes this. We hope to be able to continue the experiment one year more, in order to study the after effect of fertilizers in such soils.

Notwithstanding the failure of the experiment to show what it was planned to do, much information can be gathered from the results of the chemical examinations, which have been quite complete.

The range in the digestibility of the albuminoids of the clover, from 38 to 72 per cent, and for the timothy from 43 to 66 per cent, shows a greater variation than we had expected, but we cannot attribute this difference to the effect of fertilizers, for we find those plats intended to be duplicates showing differences little less than those differently treated.

The sugars and starch of timothy constitute a considerable portion of the nitrogen free extract, while of clover the per cent of starch is less than one-half the amount in timothy, and the same is true of that portion determined as sucrose, and these constitute little more than a third of the nitrogen free extract. These variations are shown by the following:

RED CLOVER.

	Invert sugar.	Sucrose.	Starch.	Per cent of nitrogen free extract as sugars and starch.
Minimum	2.60	.88	5.58	27.72
Maximum	5.60	4.40	13.90	43.88
Average	3.88	2.48	9.38	35.40
TIMOTHY.				
Minimum	2.40	4.68	17.55	46.40
Maximum	5.00	7.60	22.61	63.22
Average	3.23	6.21	19.72	55.69

The application of potash to the soil did not increase the per cent of sugars and starch in our experiments with timothy and clover, nor can we trace any exact relation between the phosphates and amount of albuminoids in the hays.

FERTILIZING MATTERS IN 1,000 POUNDS OF VARIOUS FARM PRODUCTS.

From the data furnished in this report we calculate the approximate amounts of the various fertilizing ingredients removed from the soil by 1,000 pounds of some of our farm products, and the principal feeding stuffs, as determined for these products at this Station. The amount of dry matter, crude ash and the phosphoric acid, potash and nitrogen are given in the following table:

TABLE SHOWING POUNDS OF FERTILIZING MATTER IN 1,000 LBS. OF FARM PRODUCTS AND FEEDS.

SUBSTANCES.	Dry matter.	Ash.	Phosphoric acid. P_2O_5	Potash. K_2O	Nitrogen.
Medium Red Clover	846	53.9	3.9	8.8	20.3
Red Clover (average 6)	846	54.9	2.5	13.1	19.3
Alsike Clover	846	72.5	3.8	24.2	21.8
Lucerne	846	73.7	4.6	13.9	20.3
Orchard Grass	846	53.5	4.1	20.1	11.1
Meadow Fescue	846	51.7	3.6	14.4	12.8
Tall Meadow Oat	846	46.4	3.2	17.5	11.6
Timothy (average 2)	846	40.6	2.3	11.7	8.7
Timothy (average 16)	846	42.2	2.5	14.4	10.5
Fodder Corn	179	11.0	0.5	2.6	2.4
Corn Fodder	700	50.3	0.9	6.1	6.5
Corncobs	900	17.8	0.1	8.1	2.3
Wheat Straw	821	41.6	1.0	5.2	4.8
Oat Straw	837	48.5	0.6	13.5	3.8
Beets	10	2.0	0.1	0.8	0.3
Oats	890	31.5	13.1	3.9	17.8
Wheat	867	15.7	7.2	3.7	18.9
Corn	844	14.1	7.7	3.6	13.9
Flour	868	3.7	1.9	1.2	14.6
Wheat Bran	850	50.4	25.5	8.3	22.5
Wheat Middlings	860	33.8	16.9	6.2	20.7
Shipstuff	860	49.5	20.2	9.7	24.1
Cottonseed Meal	917	67.3	29.3	19.6	72.1
Linseed Meal	893	51.4	18.7	11.3	52.4

AVERAGE COMPOSITION OF FODDERS.

During the past six years a large number of feeding-stuffs have been analyzed, the results of which are scattered through the several reports. That the results of these analyses may be more easy of access, and that general averages and variations may be shown, we give, in condensed form, a table showing the average composition, as determined from the number of analyses made at this Station, of all those products which are of general interest.

In this table the maximum and minimum are given, together with the averages. The grasses which were analyzed in their fresh state have also had the analyses calculated to the average water composition of hay. A large number of analyses of no special interest, as well as many partial analyses, are not included in these tables.

GRASSES, ETC.	No. analysis.	Dry Matter.			Ash.	Albuminoids. Nx 6.25.			Crude Fiber.			Nitrogen Free Extract.			Fat (Ether Extract).		
		Minimum.	Maximum.	Average.		Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.
Lucerne in bloom	4	24.99	43.27	32.54	2.95	4.07	7.69	5.91	8.67	14.81	10.51	9.45	16.47	12.02	.64	1.73	1.15
Timothy, in full bloom	21	39.14	45.02	42.60	2.08	2.52	3.68	3.23	12.18	14.49	13.38	19.71	24.08	22.64	1.11	1.63	1.36
Timothy, seed formed	3	51.22	53.02	51.86	2.25	3.14	3.38	3.28	16.57	19.35	18.16	25.03	27.74	26.72	1.32	1.60	1.45
Red clover, in bloom	21	28.85	34.17	31.66	2.05	3.80	5.63	4.51	8.46	11.31	9.77	12.64	15.80	14.03	.97	1.76	1.30
Orchard grass	3	23.75	35.00	28.52	2.14	2.40	2.97	2.65	7.60	12.54	10.23	9.23	16.73	12.39	1.14	1.35	1.21

GREEN FODDERS.	No. analysis.	Dry Matter.			Ash.	Albuminoids, N x 6.25.			Crude Fiber.			Nitrogen Free Extract.			Fat (Ether Extract).		
		Minimum.	Maximum.	Average.		Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.
Sorghum	2	15.42	16.57	16.00	.77	.90	1.04	.97	4.71	5.76	5.23	8.36	8.61	8.58	.38	.47	.43
Amber cane	3	13.62	24.96	17.56	.74	1.03	1.42	1.17	5.45	6.56	5.94	5.34	17.03	9.32	.38	.40	.39
Fodder corn	10	12.57	29.26	19.34	.99	.94	2.47	1.54	4.47	11.41	6.10	6.16	12.72	10.07	.34	.87	.58
Ensilage, fodder corn	6	13.02	21.39	15.86	.96	.72	1.60	1.00	2.97	7.10	5.14	5.90	10.22	7.92	.52	1.15	.84
Ensilage, corn fodder	2	39.28	42.14	40.71	1.72	3.54	3.71	3.62	7.83	8.39	8.11	23.90	25.69	24.80	2.36	2.56	2.46
Ensilage, Hungarian	1	....	.....	39.49	2.75	....	....	3.30	....	.....	13.60	.....	.....	17.51	....	....	2.33
Cow pea	2	13.97	17.90	15.94	1.83	3.00	3.25	3.12	2.87	4.09	3.48	5.34	8.46	6.91	.58	.62	.60
Soja hispida	3	30.65	29.59	30.13	2.38	2.20	3.94	3.34	7.93	8.91	8.36	14.24	16.01	13.90	.87	1.55	1.15
Prickly comfrey	3	11.76	21.30	15.64	2.45	1.88	3.69	2.94	2.00	3.19	2.61	5.27	10.42	7.13	.31	.84	.51

ROOTS, TUBERS, ETC.	No. analysis.	DRY MATTER.			Ash.	ALBUMINOIDS, N x 6.25.			CRUDE FIBER.			NITROGEN FREE EXTRACT.			FAT (ETHER EXTRACT).		
		Minimum.	Maximum.	Average.		Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.
Sweet potatoes	1	.....	.....	25.62	1.34	....	....	3.56	....	....	2.14	.....	.....	17.98	....	....	.60
Potatoes	3	19.61	23.80	21.51	.84	2.28	2.50	2.42	.59	.85	.68	15.33	19.91	17 50	.02	.08	.06
Cabbage, outer leaves	1	.....	.....	10.14	1.35	....	....	1.83	....	....	2.98	.....	.....	3.51	....	....	.47
Turnips	1	.....	.....	7.60	.72	....	....	1.25	....	....	1.20	.....	.....	4.20	....	....	.23
Pumpkins	1	.....	.....	7.73	.63	....	....	1.11	....	....	1.49	.....	.....	4.34	....	....	.16
Mangolds	1	.....	.....	5.59	1.09	....	....	1.03	....	....	1.00	.....	.....	2.40	....	....	.07
Carrots	1	.....	.....	8.87	1.00	....	....	1.08	....	....	1.41	.....	.....	5.09	....	....	.29
Okra	1	.....	.....	12.59	.74	....	....	1.99	....	....	3.42	.....	.....	6.04	....	....	.40
Onion	2	.....	.....	10.74	.45	1.04	1.14	1.09	.59	.71	.65	7.39	9.23	8.31	....	....	.24
Tomatoes	1	.....	.....	8.74	.73	....	....	1.00	....	....	.70	.....	.....	5.84	....	....	.47
String beans	1	.....	.....	16.54	.83	....	....	2.75	....	....	2.58	.....	.....	10.04	....	....	.34
Apples, sweet	1	.....	.....	22.70	.46	....	....	.50	....	....	1.37	.....	.....	19.96	....	....	.41

	No. analyses.	Dry Matter.			Ash.	Albuminoids. Nx 6.25.			Crude Fiber.			Nitrogen Free Extract.			Fat (Ether Extract).		
		Minimum.	Maximum.	Average.		Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.
HAYS.																	
Timothy, in full bloom	21	.....	.....	84.65	4.16	.....	.....	6.59	.....	.....	26.88	.....	.....	44.33	....	....	2.69
Timothy, seed formed	3	.....	.....	84.65	3.65	.....	.....	5.34	.....	.....	29.65	.....	.....	43.65	....	....	2.36
Orchard grass	3	.....	.....	84.65	5.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	....	.....
Mixed hays	9	82.00	90.68	85.20	4.92	4.83	9.25	6.37	31.28	35.89	32.30	26.88	46.88	39.15	2.06	3.26	2.46
Red clover, in bloom	21	.....	.....	84.65	5.50	.....	.....	12.05	.....	.....	25.99	.....	.....	37.63	....	....	3.48
Alsike clover	1	.....	.....	89.51	6.26	.....	.....	9.87	.....	.....	32.14	.....	.....	38.16	....	....	3.08
Clover, Rowen	2	85.47	85.87	85.67	6.23	10.36	11.80	11.08	28.22	29.38	28.80	35.84	36.88	36.36	3.09	3.31	3.20
STRAWS.																	
Wheat straw	1	.....	.....	82.14	4.16	.....	.....	2.98	.....	.....	42.74	.....	.....	31.04	....	....	1.22
Oat straw	1	.....	.....	83.72	4.83	.....	.....	2.35	.....	.....	36.77	.....	.....	37.97	....	....	1.80
Corn fodder	3	43.51	60.98	50.99	3.62	2.86	3.51	3.25	15.46	21.72	18.78	20.04	30.78	24.13	1.11	1.30	1.21
Soja bean fodder	1	.....	.....	78.77	8.37	.....	.....	8.42	.....	.....	22.34	.....	.....	38.29	....	....	1.35

	No. analyses.	Dry Matter.			Ash.	Albuminoids, N x 6.25.			Crude Fiber.			Nitrogen Free Extract.			Fat (Ether Extract).		
		Minimum.	Maximum.	Average.		Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.
R N, MEALS, ETC.																	
Corn	7	83.93	93.91	89.46	1.57	8.62	14.56	10.86	1.59	3.25	2.31	65.17	75.50	69.21	3.58	8.14	5.51
Corn meal	18	72.59	91.99	82.92	1.30	7.11	10.86	8.90	.50	2.81	1.74	57.02	73.96	67.16	2.23	5.06	3.82
Wheat, winter	2	86.17	87.20	86.69	1.57	10.61	13.00	11.81	2.45	3.76	3.11	67.40	69.74	68.57	1.63	1.64	1.63
Wheat flour	1	.....	.....	86.74	.38	.....	.....	10.50	.....	.....	1.21	.....	.....	73.62	.....	.....	1.03
Oats	3	83.75	89.91	86.80	3.05	10.30	11.63	10.95	10.41	19.37	15.45	50.75	54.97	53.24	4.49	3.38	4.11
Pea meal	1	.....	.....	87.92	2.61	.....	.....	21.37	.....	.....	11.06	.....	.....	52.02	.....	.....	.86
Bean, navy	1	.....	.....	87.61	3.71	.....	.....	22.17	.....	.....	7.21	.....	.....	53.14	.....	.....	1.38
BY-PRODUCTS.																	
Wheat bran	10	84.17	90.73	86.29	5.53	13.69	16.05	14.56	7.50	15.50	10.83	40.53	55.62	52.26	1.50	5.86	3.11
Shipstuff	3	84.00	85.90	85.25	5.27	14.96	17.47	16.38	4.77	8.02	6.36	53.43	53.86	52.66	4.09	4.93	4.58
Wheat middlings	3	85.96	90.56	87.59	3.61	12.45	17.99	15.62	3.56	4.70	4.22	57.69	60.83	59.66	4.22	4.88	4.48
Brewers' grains	6	20.59	25.02	23.40	.94	4.44	5.33	4.82	3.05	4.38	3.82	11.06	14.13	12.53	.84	1.44	1.29
Corn feed, starch feed, etc.	5	31.49	36.30	34.60	.21	4.31	7.70	5.96	2.07	4.29	3.41	18.69	24.93	21.41	2.00	4.27	3.51
Corn feed, "dry"	1	.....	.....	94.00	.72	.....	.....	16.04	.....	.....	13.02	.....	.....	58.14	.....	.....	6.08
Gluten meal	6	83.50	92.69	89.51	.74	15.03	30.16	21.39	.73	8.59	5.62	51.77	57.96	54.87	4.79	10.33	6.89
Linseed meal	11	87.96	92.12	90.17	5.13	28.73	35.52	31.53	4.68	13.99	11.53	28.22	39.26	34.95	3.23	10.25	7.03
Cottonseed meal	3	81.18	91.55	86.52	7.48	35.21	41.88	38.54	3.45	5.96	4.71	20.94	21.44	21.20	12.32	16.87	14.59

METHODS OF ANALYSES.

The regular method of analysis pursued has been the same as that described by Dr. Babcock,* while the method of digestion given in the Station report for 1885 has been followed. The determination of sugars and starch in feeding stuffs has been made as follows:

SUGARS.

Five grams of substance are brought upon a filter and washed with water until the filtrate amounts to 200 cc. Ten cubic centimeters (0.25 gram substance) of this solution are taken, and the sugar determined by Fehling's solution. This gives the invert sugar, glucose, etc., or water soluble extractive matter capable of reducing copper.

Another portion of the filtrate is heated on the water-bath for one-half hour with a few drops of HCl., then neutralized with sodium carbonate, and the sugar determined by Fehling's solution, as in the previous case. The difference between the two determinations gives the amount from sucrose, or water soluble matter inverted by HCl.

STARCH.

Five grams of the substance are put in a flask of 250 cc. capacity, 150 cc. of distilled water, and four to five cc. of concentrated HCl. added, and the flask closed by a cork carrying a small glass tube about three and one-half feet in length, which acts as a condensor. The flask is then put in a water bath kept at 100° C, for twelve hours, which time seems to be sufficient to invert the starch. The flask is allowed to stand over night; the solution is then filtered off, and the filtrate made alkaline by sodium carbonate, and the washing continued until the filtrate amounts to 200 cc. The sugar is then determined in 10 cc. of the filtrate, by Fehling's solution, and the starch calculated from the sugar, or better, by reading directly from a plotted chart the amount of starch for the permanganate solution required.

The ash from a considerable number of feeding stuffs has been more or less fully analyzed, especially as regards the fertilizing constituents, and the method pursued was as follows:

ASH ANALYSES.

The substance for ash analysis is burned in the same manner as for ash determination in fodder analysis, at low heat, then thoroughly pulverized in an agate mortar and preserved in well-stoppered bottles until wanted for analysis.

SOLUTIONS.

One gram of ash is weighed into a platinum evaporator, and a little water added, then a small glass funnel is inverted in the evaporator and HCl. cautiously added until effervescence ceases, then a few drops

* Report of the New York Agricultural Experiment Station, 1883, p. 166.

of HCl., in excess, and the whole evaporated to dryness. The residue is then moistened with HCl., and water added and heated on water-bath for a few minutes, then filtered through a tarred Gooch crucible. The residue is sand, silica and carbon, dried, weighed, ignited, loss taken as carbon, remainder as sand and silica.

The filtrate is made up to 200 cc. and 50 cc., used in each of the following: A, B and C:

A. SULPHURIC ACID.

Fifty cubic centimeters of the filtrate are made up to 100 cc., or more, heated to boiling, and barium chloride added and then filtered; precipitate is barium sulphate.

ALKALIES.

The filtrate from the above is heated and barium hydrate added in excess, then filtered, washed, to filtrate I cc. ammonia is added, then ammonia carbonate, and heated, then about 0.5 grams oxalic acid added and filtered, washed thoroughly with hot water, filtrate evaporated to dryness, ignited gently to drive off ammonium salts, then dissolved in water and a few drops of HCl. added, and filtered into a tarred evaporator and again brought to dryness, ignited gently at low heat, cooled and weighed as total alkalies.

POTASH.

The above residue is dissolved with water in a porcelain evaporator and platinum chloride added, evaporated on steam bath nearly to dryness, but not enough to drive off the water of crystallization, alcohol (80 per cent) added, and allowed to stand for fifteen minutes, alcohol then decanted and precipitate repeatedly washed with alcohol, then the precipitate is brought upon a tarred Gooch crucible, washed with a little ether and dried at 100 C. for thirty minutes and weighed.

SODA.

Soda is determined by difference between potash and total alkalies.

B. IRON AND ALUMINA.

Fifty cubic centimeters of the original solution were made alkaline withammonia then acetic acid added in excess. The precipitate may be feric and alumnic phosphate, but is weighed as $Fe^2 (P O4)^2$.

LIME.

The filtrate from last is heated and ammonium oxalate added, then allowed to stand in a warm place for a few hours and filtered, washed, dried, ignited intensely and weighed directly as Ca O.

MAGNESIA.

The last filtrate is made alkaline with ammonia, and then sodium phosphate added and allowed to stand, then filtered, washed, dried, ignited and weighed as $Mg_2 P_2 O_7$.

C. PHOSPHORIC ACID.

Fifty cubic centimeters of the original solution are taken, heated and about 15 grams of ammonium nitrate added, then for every decigram of $P_2 O_5$ 50 cc. of molybdic solution are added, kept for one hour at about 65 C., then a few cc. of the clear solution are tested in a test tube by adding fresh molybdic solution and heating over flame; if no precipitate forms, it is filtered and washed with ammonium nitrate solution. The precipitate is dissolved on the filter with ammonia and hot water, filtrate nearly neutralized with HCl, allowed to cool, then magnesia mixture slowly added, stirring constantly. After 15 minutes 25 cc. ammonia are added and allowed to stand two hours or more, then filtered through a tarred Gooch crucible, washed with dilute ammonia, dried, ignited intensely and weighed as $Mg_2 P_2 O_7$.

SOME EDIBLE FUNGI.

MUSHROOMS — PUFF BALLS.

The general impression has prevailed that the nutritive value of the various fungi used as food was about equal to that of meat, but a recent article by a German chemist,* C. T. Morner, states that this is an erroneous impression. Morner says: "The total nitrogen that these fungi contain varies between 2 and 3.64 per cent in the dry material. Forty-one per cent of the total nitrogen is useful in alimentation; all the rest belongs to non-assimilable bodies. Notwithstanding the relatively high figures, fungi constitute a very mediocre food, since the figures relate to dry material and fungi contain enormous quantities of water."

Among the tables presented is one giving the amount of the several fungi that would be required to equal a pound of beef:

Mushrooms	9	pounds.
Lactarius deliciosus	24	"
Chanterelle	41	"
Morel	15	"
Polyporus ovinus	67	"

So completely were the statements of this article at variance with the common opinion as to the nutritive value of fungi that I gathered and analyzed two of the most common in this vicinity during the early autumn.

MUSHROOMS.

A quantity of mushrooms (Agaracus campestris), growing in a pasture near the Station, was gathered and subjected to an analysis,

* L'Engrais; also Scientific American Supplement, June 11, 1887.

and the digestibility of the albuminoids determined by the pepsin method. The results were as follows:

	Fresh substance.	Water free.
Water	89.15	.....
Ash	.85	7.80
Albuminoids	6.08	56.00
Crude fiber	.76	7.05
Nitrogen-free extract	2.27	21.83
Fat (ether extract)	.79	7.32
Total nitrogen		8.96
Albuminoids digested		84.50

The total nitrogen found in the dry substance was about 2.5 times as great as the highest figures given by the German chemist, while the digestibility places it among the exceptionally rich nitrogenous foods. The specimens examined were not particularly good ones. I have not been able to secure either morels or boletus for examination, although not usually uncommon in the vicinity of Geneva.

PUFF-BALL.

September 4 we found portions of a large puff-ball which had been broken but a short time, probably by parties who did not know or appreciate the value of the table delicacy they had so fully scattered. Considerable of the broken fragments were gathered together and taken for analysis. This specimen was in fine edible maturity, and we hoped to be able to find another fresh one. In our search Dr. Babcock found a fine large specimen of *Lycoperdon giganteum* which I have examined. The following measurements were taken, and are of interest, taken in connection with the analysis:

Greatest diameter	12.5 inches.
Height	7.5 "
Horizontal circumference	37.25 "
Vertical circumference	33.5 "
Weight	2864 grams=6.35 lbs.

The puff-ball was kept until the following morning before examination, when it was found to have lost 5.93 per cent by weight. A slice passing through the center was taken for analysis. This contained 92.18 per cent of water.

In the following table, No. 1 refers to the whole puff-ball, which was more mature than No. 2, the broken one. No. 1, we think, also, from the fragments, to have been the larger of the two:

	No. 1.		No. 2.
	Fresh substance.	Water-free.	Water-free.
Water	92.18	....	....
Ash	.58	7.47	6.97
Albuminoids	5.19	66.34	57.44
Crude fiber	.89	11.42	11.07
Nitrogen-free extract	1.05	13.33	22.05
Fat (ether extract)	.11	1.44	2.47
Total nitrogen		10.63	9.19
Per cent alb. digested		70.04	81.72

The total nitrogen for one of the puff-balls was about three times as great as the highest figures by Morner, and even, with the large per cent of water, it compares favorably in nutritive value with meat. It would seem, from the analyses which we have made of fungi, that Morner's specimens must have been very poor ones or else the fungi growing in Germany are not so rich in albuminoids as those growing wild in this locality.

ICE-CREAM POISONING.

June 20 a small quantity of ice-cream was received, being a portion from that served at a gathering in Geneva on the evening of June 15. More than fifty persons, who were present at this gathering, were afterwards very sick with symptoms of poisoning. When received by me the cream was partially melted, but no decomposition had set in which would be likely to induce any chemical change in the products. The cream had been kept in a refrigerator since the evening of the entertainment.

Twenty-four to forty-eight hours after the eating of the cream the first real symptoms of sickness were manifest. These symptoms were, throats sore and parched, occipital pains of the head extending down the back and finally to the whole body, vomiting, and in some cases diarrhœa. The degree of intensity varied considerably among the many who were made sick, but all recovered from the effects. The symptoms were those characteristic of ptomaine poisoning, particularly that of tyrotoxicon. Some persons attributed the sickness to lead poisoning coming from the glazing of the earthen jars used in the process of preparing the ice-cream. In the sample furnished me there

was no such mineral poison present, and it is not likely that such would occur. For flavoring both vanilla and chocolate were used, and no difference was observed between the two, so that the effects could not have come from one of them. The sample examined by myself was flavored with chocolate.

I was informed that some of the milk and cream which was served with strawberries was also from the same lot as that which was frozen for the ice-cream, and that persons who ate only of strawberries and cream were equally sick with those who had eaten of the ice-cream. This being the case, it fixes the source of the poison upon the milk and not upon anything in the preparation of the ice-cream itself, and probably to no fault of the maker in this particular case.

Inquiry as to the source from which the milk was received revealed that it had been contributed by a large number of persons for the occasion, and that some of it must have been more than 24 hours old when frozen.

A portion of the sample received was shaken up with distilled water and filtered. The aqueous extract from the same was examined. Potassic ferric cyanide and ferric chloride gave a Prussian blue precipitate. Phosphomolybdic acid gave a lemon yellow precipitate, to which the addition of ammonia gave a green coloration. Phosphometatungstic acid gave a white precipitate; potassic cadmic iodide, on standing, a slight whitish precipitate; platinic chloride gave a precipitate and Millon's reägent gave a gelatinous whitish precipitate which on standing became pinkish. Sulphuric acid gave, after a little time, a violet coloration.

Although indicative of ptomaines, these reactions are by no means conclusive, and we endeavored to isolate the poisonous principle from the other matter, but failed to do so. For this purpose the aqueous extract was filtered, and made slightly alkaline with potassium hydrate, and then agitated with pure ether and the etheral layer separated and allowed to evaporate slowly over sulphuric acid, but instead of the crystals only an oily mass remained. However, it seems now that this method is not the best for obtaining the salts of this product, as is shown later.

In order to further study the effect of the poisonous property, two mice which had been fed upon corn meal, and were in a healthy condition, were fed meal saturated with the aqueous extract from the ice-cream, and about 24 hours later they first showed signs of sickness. There was roughness of the hair, arching of the back, dullness of the eyes, which were kept closed unless disturbed, apparent loss of the

free use of fore-legs and a general weakness, and they would only move about when forced to do so. The mice with backs arched remained quiet, with nose drawn down between the fore-legs and resting the foreheads upon the bottom of their cage. There was no vomiting or purging, and they gradually grew better and finally recovered.

On receiving the cream I at once forwarded a portion of it to Dr. V. C. Vaughan, of Michigan University, Ann Arbor, Mich., who was the first to thoroughly investigate the nature of these poisonous products in cheese and in cream, and who gave to them the name tyrotoxicon. Dr. Vaughan kindly examined this, and under date of July 11, wrote me as follows:

> "I will give you the results of the analysis of the cream which you had the kindness to send me. I tested for tyrotoxicon only, supposing that you had examined it for other poisons.
>
> "Some distilled water was added to the contents of the bottle, and the whole was filtered. The filtrate gave the reaction with sulphuric and carbolic acids very distinctly; but, as you know, this reaction may be due to tyrotoxicon (diazobenzol) or to nitrates or nitrites. The filtrate was then neutralized with sodium carbonate and agitated with an equal volume of ether. The ether was removed and allowed to evaporate spontaneously. To this residue a little water and a few drops of nitric acid were added, and then an equal volume of a saturated solution of potassium hydrate, and the whole heated on the water-bath, when the beautiful plates of diazobenzol (tyrotoxicon) potassium hydrate were formed.
>
> "After having obtained these crystals, I was unavoidably called away from my work for a few hours, and on my return I found that the crystals had all decomposed. So I did not have the opportunity of making other and confirmatory tests; but I should have no hesitancy, from the tests which I did make, in saying that diazobenzol (tyrotoxicon) was present."

This confirmed the result of my own examination and conclusively demonstrated that tyrotoxicon was present, and, with the experiments made upon mice, showed the cause of the sickness to be due to this product.

At a later date Dr. Vaughan wrote me as follows:

> "The action of the poison on the mice, as observed by you, is very interesting. I have obtained exactly the same symptoms with the artificially prepared diazobenzol on guinea pigs and frogs. In these animals there was neither vomiting nor purging, while the same substance induced vomiting in cats and dogs."

The method by which the milk was furnished for the occasion, and the mixing together that from so many different sources and of

different ages and then allowing them to stand for some hours, would be most favorable to the development of these decomposition products and was the probable source of trouble. Had fresh milk been used, or that from one source, there would probably have been no such serious effects resulting from eating of the cream.

It would seem as if danger of ice-cream poisoning comes principally from picnic or contributed milk, and not often from fresh or purchased milk, which is presumably of one age.

READING OF THE AIR THERMOMETERS.

1887.	January.			February.			March.			April.			May.			June.			July.			August.			September.			October.			November.			December.		
	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.
1	20.	19.5	13.	8.5	11.	7.	17.	20.7	24.7	27.	40.	36.	49.	61.5	60.5	53.7	62.	68.5	69.2	90.	88.5	68.	84.	81.2	53.	73.2	70.	60.	66.	62.5	28.	38.2	29.5	—.5	17.	12.
2	2.2	4.2	2.7	9.	22.	29.	32.	46.	40.	27.5	38.7	35.	53.7	74.	74.5	66.	64.	66.7	78.5	92.7	86.5	73.	84.	79.	59.	67.	67.7	55.	58.	57.	25.2	54.	51.5	19.5	33.	35.
3	0.	12.	13.	32	33.2	27.	22.7	26.	23.	36.	51.5	59.	62.	78.5	73.	58.	67.2	65.2	77.	92.	87.	67.5	85.7	84.2	55.	59.7	59.	55.	65.	59.	43.	50.5	45.	35.7	41.	36.
4	5.	13.	16.2	18.	17.7	14.	23.	28.	21.	49.	62.	46.	56.2	62.5	61.2	63.	73.	73.	77.5	91.	86.	71.5	85.	81.5	51.2	70.5	67.5	48.	49.7	49.	54.	49.	35.5	41.7	44.2	44.
5	17.5	22.	23.2	3.5	16.5	19.5	10.	22.	20.	22.	25.	23.5	49.5	64.	64.5	61.	72.2	68.	70.2	84.7	80.2	69.5	78.2	78.5	56.5	75.5	73.7	48.5	49.5	51.	29.	32.7	34.	37.	33.7	31.7	
6	20.	24.	21.	31.	35.	34.	33.5	35.	37.	24.5	34.	35	59.	72.	71.2	61.	65.5	64.5	73.7	83.2	83.	67.	73.	71.	61.	65.2	75.	43.7	52.5	54.5	30.	55.7	46.	29.	39.2	33.	
7	14.	15.2	8.	22.	21.5	27.5	40.5	45.5	36.5	31.5	39.5	33.	56.	69.	70.2	62.7	71.	71.5	71.5	83.5	84.	59.	65.7	63.7	69.	79.5	67.5	51.	58.	55.	33.7	66.	51.5	30.	37.2	38.	
8	0.	13.7	8.2	36.	40.2	41.	30.	34.7	33.5	29.2	49.5	51.	60.	72.5	67.2	63.7	72.5	76.	76.	88.5	86.5	55.5	71.7	72.5	52.7	62.7	60.	51.	70.	66.	44.5	43.	32.5	35.7	37.	31.	
9	6.	13.2	18.	28.5	29.	29.	35.2	46.7	41.	38.	67.	63.	59.5	75.5	69.5	68.	61.	65.7	73.	74.7	72.	62.	79.	81.	50.5	66.	64.	59.	69.	63.7	20.	38.	44.	30.2	37.	38.	
10	16.	15.	15.	27.5	42.	40.	32.2	32.	29.	62.7	72.8	67.2	57.2	73.5	76.2	68.	73.	69.7	67.2	66.	62.2	68.	81.	79.	55.	52.2	52.	62.7	66.	51.	40.7	45.	36.5	38.2	41.5	46.	
11	7.7	15.	20.5	31.7	28.7	18.5	18.5	22.5	24.5	63.	57.	43.	57.	67.5	64.7	59.	72.5	73.2	64.	74.5	79.	70.	73.	78.	41.7	59.	60.	42.7	46.	44.	30.	31.5	30.	47.5	51.	51.5	
12	20.5	30.5	28.2	10.7	14.	13.	22.	31.5	31.5	36.	41.	39.7	49.7	68.5	65.	59.7	76.	73.5	70.	85.7	84.2	67.	74.	69.	57.5	64.5	64.7	38.	42.5	42.5	31.7	34.5	34.5	37.2	34.	31.	
13	18.	18.7	20.	10.	12.5	10.	27.	38.	39.	37.	47.5	43.2	51.7	59.	58.	63.	78.5	74.	72.2	88.	85.	57.7	68.	65.2	62.	68.2	71.	45.	52.5	46.	33.	36.5	35.	34.	39.5	33.	
14	35.2	41.2	34.5	16.7	29.	30.2	27.	24.	17.2	41.	46.5	48.5	47.	65.	64.7	65.5	74.5	70.	68.	71.5	71.2	55.5	72.2	71.2	64.	70.5	64.5	38.5	43.	37.	36.5	44.2	43.7	33.	41.	36.	
15	25.2	20.	19.5	35.	38.	36.2	14.	18.5	19.	43.2	46.2	48.	48.2	72.6	73.5	58.2	76.	78.5	65.5	70.2	71.	63.	76.	74.5	58.2	70.7	57.	35.	49.	42.	40.2	40.5	36.7	32.5	33.3	34.	
16	19.	20.	19.2	33.	34.5	34.2	15.5	18.5	18.5	46.7	40.	38.5	54.5	74.7	72.2	72.	84.7	83.	80.5	93.	88.	64.5	74.7	74.2	48.	53.7	50.	37.	57.	49.	35.	40.	37.5	24.	28.	24.5	
17	34.	36.2	23.7	28.5	29.	26.5	21.	23.2	19.5	29.	37.	34.	63.	74.7	71.7	62.	64.7	63.7	72.2	75.5	82.	59.2	78.	75.	40.5	59.	58.7	45.	65.	59.	41.7	44.	38.	21.5	29.5	31.	
18	9.	.7	-2.	32.	34.5	38.7	23.7	27.	26.	29.5	30.5	26.7	55.	70.	65.	58.	70.	64.	66.2	69.	71.2	62.7	69.	73.	48.	68.	66.	49.5	51.5	47.	33.	40.	34.	29.	30.	30.	
19	4.	14.	20.5	32.	31.	29.	27.	30.5	30.	28.	38.2	40.5	53.5	71.	68.	62.7	66.	70.	65.7	80.	80.7	64.7	72.	66.2	54.	75.	63.5	40.5	54.5	47.7	35.	39.	36.	28.5	32.	21.	
20	26.2	35.2	38.5	22.	24.6	24.2	30.	35.2	32.	35.7	51.5	50.5	56.7	81.	76.2	62.5	76.2	75.5	69.	80.	76.	55.	71.	69.5	46.	60.5	59.2	41.	57.	53.	29.	28.2	26.	29.5	26.6	27.	
21	30.7	27.	21.2	18.	27.5	25.	30.	37.2	37.2	40.5	55.5	47.	64.	83.	76.7	71.	82.5	75.2	70.	80.2	69.5	60.5	74.	61.2	53.5	77.	75.	48.	47.	37.	31.	31.	27.7	29.6	28.	29.	
22	36.	41.7	43.2	29.5	34.7	27.5	30.5	31.2	31.	38.7	61.	51.2	62.	83.7	82.	63.	69.	71.	73.7	83.	70.5	63.	66.	67.	56.5	59.	54.	34.5	38.	36.5	24.	35.7	29.5	16.	18.2	20.2	
23	43.2	47.	45.2	23.2	29.	34.	18.	23.2	24.	47.	57.7	51.	67.5	82.	76.5	63.7	73.7	65.2	66.5	74.2	72.2	64.	67.7	65.2	46.	46.2	43.	31.7	39.	46	41.	45.	38.	21.	24.	23.	
24	39.5	28.7	29.2	37.7	32.	25.5	25.	42.2	41.4	40.	46.2	42.	67.	79.5	65.5	59.7	64.	60.5	66.2	79.	77.5	60.2	69.5	64.	42.7	44.2	44.7	46.	42.	40.	29.	30.9	32.	23.	27.	22.	
25	25.2	39.5	43.	13.	19.5	20.	23.7	25.	26.2	43.	52.2	50.7	63.7	75.2	67.2	59.5	71.	69.	70.5	72.	72.2	54.7	62.5	60.5	42.7	50.	45.2	35.	41.2	31.	44.2	46.	44.7	22.	23.5	23.	
26	19.	12.5	8.	26.	27.	35.	18.7	23.7	24.	42.	51.	44.5	58.5	64.	55.5	59.	69.	68.5	68.5	77.7	78.5	53.5	60.7	60.	40.7	55.	51.2	24.	39.5	37.	47.7	54.7	56.7	22.	28	26.5	
27	1.	13.	21.5	22.2	22.5	15.	22.2	26.7	33.5	39.2	50.	47.5	51.5	56.5	58.	58.5	72.2	68.5	67.5	83.	82.2	52.	66.	60.5	41.7	58.7	59.	38.	48.	46.	51.2	65.	61.7	16.5	29.2		
28	29.	35.2	38.5	10.	15.	15.5	36.	30.	25.	40.5	59.	50.	50.2	51.7	54.	61.	78.	76.7	71.	86.	85.	55.	62.2	61.7	54.	65.	58.	32.	49.5	45.	42.5	28.2	22.	33.	35.	24.	
29	37.2	37.	32.2				15.7	18.7	15.2	46.	42.2	38.	54.5	67.2	67.	65.7	83.5	82.	68.	77.	76.	52.7	69.7	67.5	56.5	62.7	62.2	41.	51.5	33.	16.	24.5	20.5	12.	13.	11.	
30	26.7	35.2	33.				14.7	25.2	25.	39.5	50.7	51.2	54.5	73.5	73.2	69.7	88.	81.5	69.2	84.	89.	57.2	71.5	67.	60.	69.5	67.	27.	27.5	26.	22.	22.	14.2	11.	12.	10.5	
31	9.5	13.	8.				17.7	31.2	33.				57.	71.2	67.7				72.5	84.2	76.7	54.	72.2	70.					25.	45.7	37.				14.	12.	21.	

READING OF THE MAXIMA AND MINIMA THERMOMETERS, 7 A. M.

1887.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT'MB'R.		OCTOBER.		NOVEMB'R.		DECEMB'R.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1....	29.	13.	14.5	6.5	17.	8.7	36.7	17.2	55.	38.	73.	52.7	91.	62.5	87.	61.	74.2	47.7	76.	58.	47.7	24.	19.5	—2.
2....	21.	1.	13.	4.	32.1	16.	43.	22.5	63.7	47.	69.7	53.	93.7	69.	86.7	76.7	75.7	58.5	69.5	53.	39.5	22.7	20.	—3.
3....	6.	—1.5	32.2	7.	51.7	21.2	40.5	27.	79.5	53.	71.	54.	95.5	67.5	86.	62.	71.	52.	64.	49.	62.	25.	36.	16.
4....	16.2	2.	35.	17.	28.	19.7	64.5	35.	81.2	56.	72.	57.	93.	68.	88.5	67.	71.5	45.	66.	47.5	62.2	24.5	42.2	34.5
5....	18.7	1.7	19.	2.	28.7	8.7	62.	21.5	67.	47.	76.5	55.5	93.2	67.2	86.	68.7	73.5	50.7	51.	46.5	62.	24.2	46.	36.5
6....	26.	12.2	31.	1.	33.5	10.	27.	20.7	71.	49.	74.	59.	85.	67.5	84.	66.2	77.5	56.	55.2	42.5	37.5	27.7	42.7	26.
7....	19.7	13.	36.	18.	44.	33.	39.	23.7	77.	52.	67.	56.7	87.2	68.	74.5	54.	75.7	60.2	56.	43.	59.7	29.	40.7	26.2
8....	18.	—6.	36.	19.	46.2	29.	40.7	22.7	73.	56.2	73.2	59.7	88.2	69.	67.5	46.	80.5	51.5	61.2	46.7	67.5	43.7	40.	29.7
9....	16.5	—3.	54.2	28.5	37.7	27.5	55.	29.	75.2	55.	76.7	72.5	91.	65.	75.5	55.	65.5	44.	78.5	46.5	45,	18.	37.	28.
10....	21.3	3.	31.2	22.	48.2	32.	69.5	37.7	78.2	54.	70.	51.	90.	64.5	83.2	62.	68.	50.	70.	58.	45.	19.	42.	29.
11....	18.	6.	45.	26.5	33.	17.5	75.7	51.5	79.	54.	75.7	50.7	70.	58.7	81.5	68.2	55.5	39.	67.7	41.7	44.7	29.7	53.5	37.7
12....	24.	—1.	31.5	10.	26.	13.	65.	35.	69.	43.7	76.	50.	80.	61.	80.	66.	64.2	41.2	50.2	35.	32.2	31.7	54.7	31.7
13....	31.	17.	15.7	7.	34.	19.	45.5	35.	70.	45.	78.2	52.7	88.7	68.2	74.5	50.2	66.	56.7	46.5	37.	35.	30.5	34.	31.
14....	35.2	15.5	16.7	6.	42.	26.	53.2	34.	61.	37.5	80.	60.5	90.	63.2	74.5	49.	74.	61.	56.5	36.	41.2	32.	43.	28.
15....	41.	24.5	35.	11.5	28.5	12.6	53.2	38.7	68.5	42.	75.	47.7	75.	60.	77.	55.	78.5	56.	45.	32.5	48.2	31.	45.	30.
16....	27.	18.	38.2	33.	20.	13.	55.	40.5	76.	46.2	84.	58.	81.5	64.	77.7	62.2	74.	44.2	51.	32.5	42.7	34.	37.	23.
17....	34.7	17.7	37.2	28.	22.	14.	47.	28.5	79.5	54.	89.2	61.5	98.	70.5	77.	54.7	57.	37.7	59.5	37.	48.	34.5	31.	20.5
18....	37.2	7.7	32.	24.2	24.5	17.2	10.2	26.5	77.	53.2	68.5	53.5	88.	66.	80.	59.	62.7	40.	68.5	44.2	46.2	32.2	32.	29.
19....	22.5	—8.	41.	24.7	28.7	20.7	33.2	17.7	71.2	45.	73.	55.5	72.5	61.2	75.1	61.7	72.	47.5	56.	38,	42.7	31.7	32.	28.5
20....	26.7	2.2	32.7	21.	30.7	20.	45.	27.7	77.	48.2	76.	57.5	83.2	65.	74.5	51.	75.5	45.	57.5	36.	40.2	28.5	32.	16.
21....	30.5	20.5	27.	11.5	37.	28.5	57.	35.5	85.	53.2	80.	60.5	83.2	68.7	73.5	53.5	65.2	45.	59.	40.5	32.	25.	32.	20.
22....	36.5	5.	31.	17,	43.	29.2	58.	34.	86.	53.7	84.	60.	82.2	67.5	76.	58.5	81.7	53.	49.2	34.	31.7	23.	30.5	14.
23....	46.	16.2	35.2	22.7	32.	17.	64.	38.	88.2	59.5	71.5	55.	83.7	66.2	67.2	62.	60.5	45.7	49.2	28.5	42.	23.	23.	13.
24....	50.7	39.5	37.7	22.	26.2	36.	61.	38.	85.5	62.7	77.	54.5	75.7	61.	71.	56.5	49.7	39.	54.2	30.2	46.5	28.5	26.	20.
25....	40.	20.	40.7	6.7	48.2	18.	48.2	30.	82.5	56.2	69.2	48.7	81.	66.	71.7	50.7	48.	41.	46.5	32.	44.5	34.	30.	13.
26....	48.	18.	26.	11.	36.5	17.5	57.	37.	76.7	51.	73.7	53.	7.75	67.2	64.	48,	57.	39.	43.	21.5	49.5	41.2	25.	20.
27....	19.2	—.7	39.	-4.(?)	26.2	17.3	53.7	29.5	66.2	47.2	70.7	58.3	81.7	60.7	63.	46.5	59.	37.2	43.5	23.	59.2	47.9	28.2	15.5
28....	30.	0.	24.	9.	36.5	20.8	52.2	33.	62.	49.	73.5	51.	85.	64.2	67.	49.7	63.	41.	50.7	29.5	68.	31.7	33.	12.
29....	44.	27.5	....	....	36.7	14.7	60.5	40.	67.2	67.	81.	56.2	89.2	67.2	67.7	46.2	66.	53.	54.5	31.	50.	15.5	37.	11.5
30....	39.	26.	....	....	19.7	10.	46.5	37.	71.2	46.	87.	61.	80.	62.5	72.2	50.2	64.7	56.	54.1	25.7	26.7	15.	13.	9.5
31....	42.7	8.2	....	....	27.7	12.7	....	....	77.	54.	....	....	91.7	69.	73.	47.7	....	....	32.	21.2	....	....	15.	8.

READING OF SOIL THERMOMETERS.

APRIL, 1887.	1 INCH.			2 INCHES.			3 INCHES.			6 INCHES.			9 INCHES.			18 INCHES.		
	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
9	36.5	.....	55.5	35.7	.....	56.5	35.7	.....	55.2	.....	.....	.....	36.7	.....	45.	37.	.....	38.
10	51.7	65.2	62.	50.	64.5	63.2	49.	59.9	62.	.....	.....	.....	44.2	46.5	61.2	39.7	40.2	41.5
11	54.	57.2	51.5	52.5	56.5	53.5	52.	55.2	53.7	.....	.....	.....	48.	48.5	50.	43.	43.2	43.5
12	.....	48.2	45.7	.....	47.5	46.7	.....	47.	47.	.....	.....	.....	.....	44.5	45.5	.....	42.2	42.
13	41.	52.5	50.5	41.	49.5	52.2	41.5	48.	52.	.....	.....	.....	41.5	43.2	47.	42.5	42.5	42.5
14	41.	49.	49.5	41.	47.5	50.5	41.5	46.7	50.2	.....	.....	.....	42.5	43.	46.	42.5	42.5	42.5
15	42.2	46.5	48.5	42.2	45.	49.	42.2	44.5	48.7	.....	.....	.....	43.	42.7	44.2	43.	42.5	42.7
16	45.5	42.7	41.	44.	43.5	42.	44.2	43.7	42.5	.....	.....	.....	43.7	43.7	43.	42.7	42.7	42.7
17	33.2	50.	43.5	34.	47.7	45.	35.	45.7	45.7	.....	.....	.....	37.7	40.	43.5	40.5	41.2	41.2
18	32.5	36.	33.7	33.5	36.	34.2	34.5	36.5	35.	.....	.....	.....	38.5	38.	38.	41.	40.5	40.5
19	33.7	49.	45.5	33.7	45.7	46.7	34.2	42.2	46.7	.....	.....	.....	36.7	37.2	42.5	40.	39.5	40.
20	34.	52.	47.7	34.	48.	48.	35.	46.7	48.5	.....	.....	.....	38.2	40.	44.5	40.2	40.	40.7
21	39.	52.7	49.2	38.2	50.7	50.	35.	49.2	50.	.....	.....	.....	40.5	42.5	45.5	41.2	41.2	41.7
22	40.	66.	52.2	39.5	55.	52.5	39.7	53.	52.7	.....	.....	.....	41.7	44.2	48.	42.	42.2	43.
23	45.7	56.7	51.7	45.5	54.5	52.2	45.7	53.	52.2	.....	.....	.....	45.5	46.	48.7	43.7	43.7	44.2
24	41.	53.	48.	41.	51.5	49.2	41.2	50.	49.5	.....	.....	.....	43.5	44.5	46.7	44.2	44.	43.7
25	40.5	54.2	48.5	39.5	52.5	49.	40.	51.2	49.	.....	.....	.....	41.	44.	46.2	43.5	43.2	43.5
26	41.7	54.5	47.7	41.5	54.	48.7	42.	52.	49.	.....	.....	.....	43.7	45.5	47.	43.7	43.7	44.
27	37.5	56.7	49.5	39.	54.7	49.5	39.	52.5	49.5	.....	.....	.....	42.	44.5	47.	44.	53.5	44.
28	41.5	57.2	50.	40.7	54.5	50.2	41.	53.	50.5	.....	.....	.....	43.	45.2	47.7	44.	44.	44.2
29	45.5	46.2	42.	45.5	46.5	43.2	46.	46.5	44.	.....	.....	.....	46.	46.	45.	45.	44.7	44.7
30	40.	52.	48.2	40.	50.	49.7	40.7	48.7	50.7	.....	.....	.....	42.5	43.7	47.2	44.	43.7	44.

READING OF SOIL THERMOMETERS—(*Continued*).

MAY, 1887.	1 INCH.			2 INCHES.			3 INCHES.			6 INCHES.			9 INCHES.			18 INCHES.		
	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.
1	45.5	60.7	56.2	44.	58.	56.7	43.5	55.5	56.7	.....	.....	.....	43.5	46.5	50.2	44.5	44.5	45.
2	52.2	66.2	65.2	49.	62.	64.7	48.7	59.7	63.7	.....	.....	.....	47.5	49.7	54.7	46.	46.2	47.2
3	57.7	74.5	73.2	56.5	71.	73.7	56.	68.	72.5	.....	.....	.....	53.	55.5	60.7	49.	49.	50.2
4	57.	69.7	68.2	57.	67.7	69.2	57.	65.7	69.	.....	.....	.....	56.	56.7	60.7	51.7	51.5	52.2
5	52.5	69.2	67.5	52.2	67.5	68.	52.7	64.	67.2	54.	57.5	63.	54.	55.5	59.7	52.2	52.	52.2
6	58.	72.2	69.	56.7	68.5	69.2	56.2	66.5	68.2	55.2	59.5	64.	55.	57.	60.5	52.7	52.7	53.
7	56.5	67.5	68.	56.2	65.2	68.2	55.5	63.7	67.5	56.	58.5	63.2	56.2	56.7	60.5	53.7	53.5	53.7
8	58.2	76.	73.	58.	72.	73.5	58.	69.5	72.5	58.	61.5	67.	57.	59.	63.2	54.	54.	54.7
9	60.	79.5	74.	59.7	75.2	75.	59.7	73.7	74.2	59.	64.	69.2	59.	61.	65.5	55.2	55.2	56.
10	59.	75.	74.5	58.7	71.5	74.5	59.	69.2	74.	59.7	63.	68.	59.7	60.7	64.7	56.5	56.5	56.7
11	57.2	73.	71.	58.	72.	72.5	58.	70.	72.5	59.	62.7	68.5	59.	60.5	65.2	57.	56.5	57.
12	53.5	72.2	68.5	53.7	69.7	69.2	54.2	67.5	69.	56.2	60.2	65.	57.2	58.5	62.5	56.7	56.2	56.5
13	53.	68.2	66.	54.	67.7	67.5	54.	65.7	67.7	55.	59.7	64.7	56.	58.	62.2	56.	55.5	56.
14	50.5	71.5	71.	51.	68.2	71.2	51.2	65.5	70.5	53.	58.2	65.2	54.5	56.5	62.	55.5	55.	55.5
15	52.2	73.5	73.5	52.7	70.2	73.5	53.	67.2	72.5	54.2	59.2	66.5	55.5	58.7	63.2	55.5	55.5	55.7
16	55.5	76.5	74.	55.5	73.7	74.5	55.7	71.	74.2	56.5	62.	68.	57.2	59.5	65.2	56.2	56.	56.7
17	60.	75.	74.2	59.2	74.	75.	59.2	71.2	74.2	59.	63.5	69.5	59.5	61.5	66.	57.5	57.2	58.
18	59.2	77.	72.5	59.2	74.7	73.5	59 7	72.2	72.2	60.5	64.5	69.	60.5	62.2	66.	58.	58.	58.5
19	56.5	73.	70.5	56.	70.5	71.5	56.	68.5	71.	58.	62.	67.5	59.	60.5	65.	58.2	58.	58.
20	58.	79.	77.5	57.	75.7	78.	57.2	72.7	77.2	58.2	63.5	71.5	59.	61.5	67.5	58.5	58.	58.7
21	63.7	82.7	79.7	62.2	80.2	80.5	61.5	77.	80.	61.5	67.2	74.5	62.	64.5	70.2	59.5	59.5	60.
22	63.5	80.7	77.5	62.5	77.5	77.5	62.5	75.2	77.2	63.	67.5	72.5	63.2	65.2	69.5	60.7	60.2	61.
23	65.5	81.7	75.7	64.5	79.	76.2	64.5	76.7	76.2	64.5	68.5	72.7	64.5	66.2	69.7	61.2	61.	61.5
24	67.	80.7	68.2	66.	78.	70.	66.	75.7	70.7	65.5	69.	71.	65.	66.7	69.	61.5	61.5	61.5
25	64.	78.	70.5	62.5	77.	71.7	62.5	74.5	72.	62.2	67.5	70.2	62.7	65.2	67.7	61.2	61.	61.
26	60.	72.5	62.7	59.5	71.	64.	59.5	68.5	64.5	60.5	64.	65.	61.5	62.7	64.	61.	60.5	60.5
27	55.5	61.7	63.	55.5	60.5	63.	56.	60.2	63.	57.5	58.7	62.5	58.7	59.	60.7	59.7	59.	58.7
28	54.	56.2	56.5	54.2	56.5	56.5	54.7	56.5	57.	56.5	56.5	57.	57.5	57.	57.2	58.	58.	57.5
29	55.2	77.7	71.2	54.	74.5	72.2	53.	70.	72.5	53.	61.	68.2	53.3	58 2	65.	56.5	56.7	57.5
30	57.2	76.5	74.2	56.5	75.	75.	56.	71.5	75.	57.	63.	70.5	58.2	61.	66.7	58.5	58.2	59.
31	60.	75.7	72.	60.	74.	73.2	60.	71.7	74.	60.5	65.	70.5	61.2	63.	67.2	59.7	59.5	60.

READING OF SOIL THERMOMETERS — (*Continued*).

JUNE, 1887.	1 INCH.			2 INCHES.			3 INCHES.			6 INCHES.			9 INCHES.			18 INCHES.		
	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.
1	57.2	65.	67.	58.	63.5	67.	59.	63.	67.	61.	60.7	64.5	61.5	60.7	63.	60.	59.5	59.5
2	63.2	64.7	69.2	62.5	64.	69.7	62.2	63.7	69.2	61.2	62.2	65.2	61.2	61.5	64.	59.5	59.2	59.5
3	59.	71.	70.	58.5	68.7	70.2	59.	67.5	70.2	59.5	63.	68.	60.	61.5	65.5	59.5	59.2	60.
4	63.2	80.2	76.2	62.	78.2	76.4	61.2	74.	76.5	60.5	66.	72.	61.2	63.7	69.7	60.2	60.	61.
5	63.2	76.	71.5	62.5	73.	71.5	62.7	71.7	71.2	63.2	66.	69.2	64.	64.7	67.2	62.	62.	61.7
6	63.	67.	66.	63.	66.	66.	63.	65.5	66.	63.2	63.7	65.	63.5	63.2	64.2	61.7	61.5	61.5
7	63.7	79.	75.5	62.2	76.	75.	61.2	73.2	74.	60.5	65.2	70.	61.2	63.5	67.5	60.7	60.5	62.
8	66.2	78.5	79.	65.2	76.	79.5	65.	73.5	79.5	64.5	67.	74.2	64.5	65.5	70.5	62.	62.	62.5
9	68.	67.7	71.2	67.2	67.7	71.5	67.	67.7	71.5	66.2	66.7	67.2	66.2	66.2	67.	63.2	63.	63.2
10	61.2	84.2	77.2	60.5	82.	79.2	60.5	78.	78.5	61.	68.	74.5	62.2	65.5	71.	62.2	62.2	62.7
11	63.5	84.	77.7	62.5	81.2	79.	60.5	77.5	79.5	62.5	68.5	75.7	63.5	66.	72.	63.	62.7	63.2
12	64.5	86.7	79.7	63.5	84.5	81.	62.5	80.2	81.2	63.2	69.7	77.2	64.5	67.	73.5	63.5	63.5	64.
13	66.5	88.5	79.	65.2	86.5	79.2	64.	82.2	80.5	65.	71.5	77.	65.7	68.7	73.5	64.5	64.2	65.
14	69.5	89.5	80.2	68.	86.7	82.	66.7	82.	82.5	66.5	72.5	78.7	67.	69.5	75.	65.	64.7	65.5
15	64.	83.5	82.7	63.5	80.7	83.2	63.	77.5	83.2	64.5	69.5	78.	66.	67.7	74.2	65.5	65.	65.5
16	70.5	85.7	83.7	69.5	82.5	84.2	68.7	80.5	84.	68.2	83.2	79.	68.5	70.7	75.7	66.	65.7	65.7
17	68.2	72.2	70.	69.5	71.2	70.5	69.7	70.7	70.5	70.5	69.5	70.2	70.5	69.2	69.2	66.7	66.5	66.
18	61.2	77.5	69.7	61.	75.	70.5	61.2	73.7	71.	62.7	67.2	70.5	63.7	65.7	69.	64.5	64.2	64.5
19	64.	68.5	72.	63.	67.5	72.	62.2	67.	71.5	63.	65.5	69.2	64.	65.	67.7	64.	63.5	64.
20	65.	83.5	78.2	64.2	82.2	78.7	64.	78.2	79.	64.	69.5	75.5	64.5	67.2	72.5	64.	64.	65.
21	70.2	81.5	75.	69.	79.5	75.2	68.	77.5	75.	67.	70.5	73.2	67.5	69.	71.5	66.5	65.5	65.7
22	65.5	74.5	72.5	65.	73.	72.2	65.2	71.	72.	66.5	67.5	70.	67.	67.	68.7	65.7	65.5	65.5
23	63.5	75.	71.	63.2	73.	71.5	62.2	72.5	72.	63.2	67.5	70.7	64.5	66.5	69.2	65.	64.5	65.
24	62.5	71.	65.2	62.	71.	65.7	62.	69.2	66.	63.	65.5	66.5	64.2	65.	66.5	64.7	64.2	64.2
25	59.5	75.5	73.5	58.7	75.5	73.7	57.7	72.5	73.2	58.7	65.	70.5	60.7	63.7	68.2	63.2	63.	63.5
26	61.	80.5	76.2	61.2	78.5	77.7	60.5	75.2	78.	62.	67.5	74.5	63.5	66.	71.5	64.	63.7	64.5
27	61.	82.7	78.2	61.5	80.7	79.5	61.5	77.5	79.5	63.	68.7	75.7	64.7	67.	72.5	64.	64.5	65.
28	63.	88.	81.	63.5	85.	81.7	62.4	80.7	81.7	63.5	70.5	77.7	65.	68.2	74.5	65.2	65.2	65.7
29	67.2	90.7	86.	67.	88.5	86.7	65.7	84.	86.7	60.5	73.5	81.	67.5	70.7	77.	66.2	66.5	67.2
30	70.5	93.	87.	70.5	90.	87.5	69.2	86.	87.7	69.7	75.7	82.5	70.5	73.	79.7	68.	68.2	69.

READING OF SOIL THERMOMETERS — (*Continued*).

JULY, 1887.	1 INCH.			2 INCHES.			3 INCHES.			6 INCHES.			9 INCHES.			18 INCHES.		
	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.
1	71.5	92.	89.2	71.2	89.5	89.5	71.	86.7	89.5	71.7	77.	84.	72.2	74.2	80.	68.5	69.	70.
2	78.2	96.5	90.7	77.	92.5	90.7	76.	90.	90.5	75.	81.	85.5	74.5	77.5	81.7	70.5	70.5	71.5
3	77.5	99.7	89.7	76.7	95.5	90.	76.	91.	89.7	75.	81.	85.5	75.2	78.	82.	71.7	71.7	72.2
4	77.	95.	89.5	76.5	91.2	89.5	75.7	88.2	89.5	75.	79.5	85.5	75.2	77.	83.	72.2	72.	72.5
5	73.5	92.	85.5	73.5	87.7	85.5	73.5	85.2	85.	74.5	77.7	81.7	75.	76.	79.	72.2	72.	72.
6	73.2	85.	78.	72.7	84.2	79.	72.5	82.5	80.	72.5	77.5	79.	73.2	75.5	77.2	71.5	71.	71.2
7	70.2	90.5	87.2	70.2	88.5	88.2	69.2	85.5	88.5	69.5	76.	83.5	70.5	74.	80.	70.5	70.2	71.
8	75.2	96.2	90.2	75.	94.2	91.7	74.	90.2	91.7	73.5	80.	86.7	73.7	77.	82.7	71.5	71.5	72.5
9	75.2	86.7	75.2	74.5	85.5	75.5	74.2	84.7	76.	75.	79.5	76.	75.2	77.	76.	72.5	72.5	72.
10	67.7	69.5	66.7	68.	70.	67.7	68.5	70.2	68.2	60.	70.5	69.5	70.7	70.5	70.2	70.5	70.	69.5
11	63.	80.	79.5	63.2	78.5	80.5	62.5	76.5	81.5	64.2	69.5	77.5	66.	68.5	74.5	68.	67.5	68.2
12	68.	90.	87.	67.	89.	88.	65.	85.	88.2	66.	74.5	83.2	67.5	72.	79.	67.	68.5	69.2
13	73.7	91.5	89.	73.2	90.5	90.	73.2	87.	90.2	73.5	77.7	85.7	73.5	75.5	81.2	70.7	70.7	71.5
14	72.	88.7	83.2	72.7	87.5	85.	72.	85.	85.5	73.	77.5	83.	73.7	75.5	80.	72.	71.5	72.
15	70.2	75.5	76.5	70.	74.7	76.7	70.2	74.7	76.7	71.5	73.5	74.5	72.5	72.7	73.5	71.5	71.	70.7
16	92.7	95.5	85.2	71.2	91.	85.2	70.5	88.	85.2	70.	77.7	82.	70.5	74.5	79.5	70.	70.	71.
17	73.5	78.2	82.2	73.5	77.	82.7	73.7	76.	82.7	74.	73.7	79.5	74.	73.5	77.2	71.5	71.2	71.2
18	72.	75.2	74.	71.7	74.	74.5	72.	73.5	74.7	72.5	72.2	73.7	72.7	72.5	73.2	71.2	71.	70.7
19	67.5	84.7	82.5	66.7	82.7	82.5	66.7	80.2	83.2	68.	73.5	79.5	69.2	72.	76.7	70.	69.7	70.2
20	69.2	85.5	82.	69.5	84.	83.	69.5	82.	83.5	70.7	75.	81.	71.5	73.5	78.	70.7	70.5	71.
21	71.5	85.7	74.	71.5	83.	76.	72.	81.2	77.	73.	74.5	76.	73.2	73.5	78.5	71.2	71.	71.
22	72.7	80.2	74.5	72.	79.	74.5	71.5	78.	75.	71.2	73.7	74.5	71.5	73.	74.	71.	70.7	71.
23	69.2	81.2	77.	69.2	79.7	77.7	69.5	78.5	78.5	70.5	73.2	77.5	71.	72.2	75.7	70.7	70.5	70.7
24	67.5	82.2	81.7	67.2	80.5	83.5	67.	79.2	84.5	68.5	73.	80.7	70.	71.7	77.5	70.7	70.5	71.
25	72.	75.5	75.	71.7	75.7	75.	72.	75.7	75.	72.5	74.5	74.	73.	73.5	73.7	71.5	71.5	71.5
26	71.	80.7	81.	70.5	80.	81.2	70.5	78.2	81.2	71.	73.2	78.5	71.5	72.5	76.7	71.	71.	71.2
27	68.	85.	83.	68.	82.5	82.5	67.5	80.5	82.2	69.5	74.5	79.2	71.	73.	77.	71.5	71.2	71.7
28	70.	86.	85.5	69.5	84.2	86.2	69.5	82.5	86.2	70.5	75.5	82.	72.	73.7	78.5	72.	71.7	72.
29	72.	83.5	34.	72.5	81.	84.5	73.	79.5	84.2	73.7	74.5	80.5	74.	74.	77.7	72.5	72.5	72.5
30	71.	88.7	89.7	70.	85.2	89.5	69.5	83.5	89.	70.5	76.7	83.5	71.5	74.	79.7	72.	72.	72.5
31	75.	91.7	87.5	75.	88.	89.	75.	86.2	89.	75.2	79.2	85.5	75.5	77.	81.7	73.5	73.5	73.7

READING OF SOIL THERMOMETERS—*(Continued)*.

AUGUST, 1887.	1 INCH.			2 INCHES.			3 INCHES.			6 INCHES.			9 INCHES.			18 INCHES.		
	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.
1	69.	84.	73.2	67.7	80.5	74.	68.	79.7	74.2	69.	74.5	74.	69.7	71.5	73.	70.	69.5	69.5
2	67.5	76.5	72.	67.	73.7	74.7	67.2	73.5	75.2	68.5	71.	75.	69.2	69.7	73.	69.2	69.	69.
3	57.	70.	68.	58.	67.5	70.	59.	67.2	70.	62.	64.7	69.5	54.5	64.5	68.	68.	67.	67.
4	61.	75.2	74.5	59.2	71.7	75.5	59.7	70.7	75.	61.2	66.5	72.2	63.	65.	69.2	66.	65.5	66.
5	61.5	77.5	69.2	60.5	74.5	70.2	61.	73.	70.	62.5	68.5	69.5	64.2	66.	68.	66.	65.5	66.
6	59.2	78.7	77.	58.	73.5	78.5	58.5	72.	78.2	60.	67.	75.2	62.	64.5	71.5	65.2	65.	65.5
7	64.5	82.5	76.	63.2	78.	77.2	63.5	76.5	77.2	64.7	70.5	75.5	65.5	67.5	72.5	66.2	66.	66.5
8	64.	84.5	81.	63.7	79.5	82.2	64.	77.5	82.	65.7	71.5	79.	66.5	68.5	74.7	67.	66.7	67.5
9	66.2	85.5	83.	66.	81.	84.	66.2	79.5	83.5	67.7	73.2	80.2	68.5	70.2	76.	68.	67.7	68.5
10	69.	85.5	83.	68.2	82.	83.5	68.7	80.2	83.	69.5	75.	79.7	70.	71.7	76.2	69.	68.7	69.2
11	71.5	86.2	81.5	71.5	83.2	82.7	71.5	81.7	82.5	72.	76.2	80.7	71.7	73.	77.5	69.7	69.5	70.
12	65.	77.5	74.5	65.6	75.7	77.5	66.2	74.7	77.5	68.5	71.5	76.	69.5	70.	73.5	69.5	69.	69.
13	62.	79.2	72.	62.	76.	73.	62.5	75.2	73.	68.5	70.2	72.5	66.2	68.	71.	68.2	67.7	68.
14	68.	75.7	71.2	67.5	74.	74.	67.5	73.2	71.	68.5	70.	73.5	68.5	68.7	71.7	68.	68.	68.
15	61.	77.	74.7	60.	75.5	78.	60.5	74.	77.7	62.2	68.5	75.7	64.5	66.5	72.2	67.2	66.7	67.
16	61.	71.5	67.	61.5	70.2	67.	62.	69.7	67.	64.	67.5	67.5	65.5	66.2	67.	67.	66.5	66.5
17	61.	65.7	63.7	62.5	65.5	64.5	62.	65.2	64.5	63.5	64.7	65.	64.5	64.5	65.	66.	65.5	65.5
18	58.	72.5	68.5	57.	70.5	70.2	57.7	69.	70.	59.2	65.	69.5	61.2	63.2	67.5	64.7	64.2	64.5
19	57.7	75.5	73.7	57.2	74.2	76.	58.	72.	75.7	59.7	66.5	73.5	61.5	64.	70.	64.5	64.5	65.
20	60.	77.2	74.	60.	75.2	76.	60.5	74.2	76.	62.	68.	74.2	63.5	65.5	70.7	65.5	65.	65.5
21	63.	76.5	74.	63.5	76.	75.2	64.	75.7	76.	65.5	69.9	74.2	66.	67.5	71.5	66.	66.	66.2
22	63.5	75.7	76.2	63.7	74.7	77.7	64.5	74.5	77.7	65.5	69.5	75.5	66.2	67.2	72.	66.5	66.2	66.7
23	65.	74.	74.7	65.5	71.	75.	66.	70.7	75.	67.	68.2	72.7	67.2	67.5	70.2	66.7	66.5	66.5
24	67.	73.5	69.5	67.2	72.	70.2	67.2	71.5	70.	68.	69.	70.	68.	68.	69.	66.	66.7	66.7
25	66.	77.5	73.2	65.5	75.7	74.7	65.5	74.7	74.5	66.	70.2	73.2	66.5	67.7	70.7	66.5	66.5	66.7
26	60.5	77.	78.5	61.	77.7	80.5	61.5	76.5	80.	63.5	69.7	76.7	65.	67.	73.	66.5	66.5	67.
27	63.7	83.	81.5	64.	81.5	83.	64.5	80.	82.5	66.	72.2	79.	67.	69.	75.	67.5	67.2	68.
28	65.7	83.2	81.2	66.	81.7	83.	66.7	80.5	82.7	68.5	73.7	79.7	69.	70.5	75.7	68.2	68.2	68.7
29	67.7	83.5	82.	68.2	81.7	83.5	68.7	81.	83.5	70.	74.5	80.5	70.5	71.7	76.5	69.	69.	69.5
30	71.	81.5	70.2	71.	80.	72.5	71.2	80.	72.5	72.	75.5	74.5	71.5	73.	74.	70.	69.7	70.
31	66.2	71.5	68.	67.	71.	70.	67.2	70.5	70.	69.	69.5	70.7	69.5	69.	70.	69.2	68.7	68.5

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SEPTEMBER, 1887.	1 INCH.			2 INCHES.			3 INCHES.			6 INCHES.			9 INCHES.			18 INCHES.		
	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.	7 A. M.	12 M.	6 P. M.
1	56.7	78.	73.5	57.	77.5	76.	58.2	73.5	74.7	61.5	66.	72.	63.2	65.	69.5	65.5	65.	65.5
2	62.2	68.	67.7	62.5	68.	68.	63.	67.7	68.	64.7	65.7	67.5	65.5	65.5	67.	65.5	65.5	65.5
3	57.7	69.7	69.2	58.2	69.2	70.7	59.2	68.	70.7	61.5	64.	69.5	63.5	64.	67.5	65.	65.	65.
4	53.5	76.7	74.5	54.	76.7	76.	55.	73.5	75.5	58.5	64.5	72.2	61.	63.5	69.2	64.5	64.5	64.5
5	58.	78.7	77.5	58.	79.	78.5	59.	75.5	77.5	61.2	68.2	73.5	63.	65.	70.5	65.	64.5	65.
6	61.2	66.5	74.2	61.2	66.5	74.2	62.	66.	70.5	63.5	65.	68.	64.5	64.7	67.	65.5	65.	65.
7	66.7	81.	73.	66.5	80.5	75.	64.5	78.2	75.7	66.	70.	74.2	66.2	68.2	72.	65.2	65.7	66.2
8	58.7	72.2	70.	59.5	71.7	71.5	60.5	70.2	71.5	63.	65.	70.5	64.5	65.	68.7	66.	65.5	65.5
9	54.	67.7	64.	54.2	66.2	64.5	55.5	65.	64.7	59.5	62.5	64.5	61.5	62.5	64.5	64.7	64.	64.
10	58.	57.7	57.	58.5	58.2	57.7	59.5	59.	58.5	61.	60.5	60.	62.2	61.5	61.2	63.5	63.2	63.
11	46.5	66.7	61.	47.2	64.5	61.2	48.5	62.	61.5	53.	57.	61.5	56.	57.5	61.	61.7	61.	61.2
12	57.2	65.7	61.5	57.5	63.7	61.5	57.5	62.2	63.	58.	59.7	62.	59.	59.7	61.7	61.	61.2	61.5
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16	51.	64.5	60.	51.2	62.7	62.2	52.5	61.7	63.	56.5	58.5	63.	59.	59.5	62.2	62.7	62.2	62.
17	45.7	66.2	63.2	46.2	67.	65.2	48.	64.5	65.2	52.5	57.2	64.	55.5	57.5	62.	61.	60.5	60.5
18	49.	67.7	67.	49.	67.5	68.2	50.5	65.7	68.2	54.	58.5	65.7	56.	58.	63.2	60.2	60.	60.2
19	55.2	73.5	68.	55.2	73.	70.	56.2	71.	70.2	58.	62.7	68.5	59.5	61.5	66.	60.7	61.	61.5
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21	53.2	69.5	70.	52.7	68.7	70.	53.7	67.	69.7	56.	64.2	66.5	57.7	59.5	64.5	61.	60.5	61.
22	57.5	63.2	58.5	58.2	62.7	59.7	59.2	62.5	60.5	61.5	61.5	61.5	62.	61.7	62.	62.	61.7	61.7
23	51.	55.7	50.5	51.5	55.2	52.	52.7	55.5	55.2	56.	55.	55.5	57.7	56.5	56.7	60.5	60.	59.5
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25	48.	54.	50.5	48.2	53.5	51.7	47.	53.	52.5	50.	52.	53.7	52.	52.7	54.5	56.	56.5	56.2
26	43.	60.2	56.	43.2	59.2	57.7	44.5	58.	58.7	48.	52.	58.	50.5	52.	56.6	55.7	56.7	56.
27	45.5	62.	59.	45.7	59.2	59.5	46.5	57.	59.6	49.5	52.2	57.7	51.5	52.5	56.7	55.7	55.5	55.7
28	54.	69.	61.2	54.	68.2	62.5	54.5	66.	63.	55.	58.5	62.5	55.5	57.	60.7	56.5	56.7	57.2
29	57.2	63.7	62.	57.	62.2	62.2	57.2	61.2	62.	57.5	58.5	61.	57.7	58.2	60.	58.	58.	58.2
30	59.5	70.	67.5	59.2	68.2	68.	59.2	67.	68.	59.	62.	65.5	59.	60.5	63.5	58.5	58.7	59.5

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3	53.	63.	54.5	52.5	62.2	55.	53.	60.5	56.2	54.5	56.	58.	56.5	56.5	58.5	59.	58.5	59.7
4	49.5	50.2	49.	50.	50.5	49.5	50.5	51.	50.5	53.	52.5	52.5	54.5	54.	54.	57.	57.	57.
5	49.5	51.	52.	49.	51.	52.5	50.	51.5	53.	51.	52.	53.5	52.5	53.	54.	56.	56.	56.
6	46.	53.	52.5	46.2	53.	52.2	47.	53.	53.	50.	52.	53.5	52.	52.5	53.7	55.5	55.5	55.
7	50.5	57.7	57.	50.2	57.	57.7	50.7	56.2	58.	51.5	54.5	57.	53.	54.2	56.5	55.5	55.2	55.7
8	51.	67.	64.5	51.	66.5	65.2	51.2	64.5	65.5	53.	57.5	63.5	54.	56.	61.	56.	56.	56.7
9	58.	65.	62.	58.	64.3	63.	58.	63.7	63.	58.5	60.5	61.5	58.5	59.7	60.5	58.	58.	59.
10	60.7	65.2	55.5	60.5	65.	57.	60.7	64.5	58.	60.	62.	60.	60.	61.	60.5	59.	59.	59.
11	48.5	52.	49.7	49.	52.	51.	50.	52.5	52.	53.5	53.	54.5	55.5	54.7	55.5	58.	52.5	57.2
12	40.7	46.5	44.5	41.	46.7	45.5	42.5	47.	46.7	47.	48.	48.	50.	50.	50.5	56.	55.2	54.5
13	43.	50.	47.	42.7	51.5	47.7	43.7	51.2	49.	46.	48.5	50.2	48.	49.	50.7	48.7	53.5	53.7
14	39.	46.5	41.5	39.5	46.7	43.2	41.	46.5	45.	45.	47.5	48.	47.7	48.5	49.	52.7	52.5	51.5
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19	43.	59.2	51.5	42.5	59.5	53.7	44.5	57.7	55.	47.	51.5	55.5	49.2	51.	54.	52.5	52.7	53.5
20	41.	55.7	52.	41.	55.	53.	42.2	53.5	53.5	46.	49.	52.7	48.2	49.2	52.5	52.2	52.	52.
21	45.	47.5	42.	47.	48.5	44.	48.	48.7	46.	49.7	49.5	49.5	51.	50.5	50.	52.5	52.5	53.
22	35.7	40.	38.	36.2	41.5	37.5	37.7	42.5	40.	42.	43.5	43.	45.	45.	45.	51.	50.2	50.
23	34.	39.2	40.	33.5	38.5	39.5	34.7	38.8	40.	37.5	39.7	40.5	40.7	41.	41.2	48.5	48.5	47.7
24	43.2	43.	41.	42.5	43.2	41.5	43.2	44.	42.2	44.	44.5	44.	46.	45.2	45.	48.	48.	48.
25	36.5	44.	38.	36.	43.7	39.5	37.2	43.2	41.	40.	42.	43.5	42.5	43.	43.	47.7	47.5	47.5
26	30.	42.5	40.	31.	40.	41.7	32.7	38.5	42.2	36.5	37.	43.	39.7	38.7	42.7	46.5	46.	46.
27	38.5	47.5	45.	38.	46.	45.2	38.	45.	45.5	40.	42.	45.	40.5	42.5	44.7	46.	46.	46.
28	34.2	48.	44.7	34.2	49.	46.2	35.5	48.	47.2	39.	43.	47.5	41.5	43.	46.	46.2	46.2	46.5
29	41.	47.2	41.	40.7	46.2	42.2	41.	45.5	43.2	42.	43.5	45.	43.5	44.	45.	46.7	46.7	46.7
30	33.	35.	33.7	34.	35.3	35.1	35.	35.8	36.2	38.5	38.2	39.5	41.2	40.5	40.7	46.	46.	45.5
31	29.7	44.2	40.5	30.5	44.	42.	31.7	42.2	43.	35.	37.	43.5	38.	38.7	43.	44.5	44.2	44.

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